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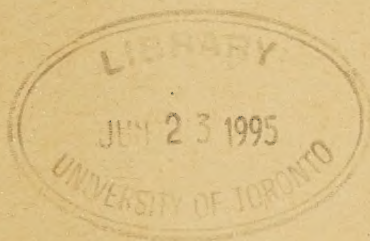
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# NATURAL RESOURCES CANADA

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Vol. 5

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No. 7

## DEVELOPMENT OF TREE PLANTING IN WESTERN CANADA

OVER 5,500,000 TREES DISTRIBUTED THIS YEAR

### Important Work of Department of the Interior's Nursery Stations—Change in Prairie Landscape

A gradual change in the general prairie landscape is taking place in Western Canada as a result of the co-operative tree-planting work being carried on by the Forestry Branch of the Department of the Interior. This change is particularly striking to those who were familiar with conditions as they existed in Manitoba, Saskatchewan and Alberta some twenty-five years or thirty years ago. Thousands of shelter-belts have been established from seedlings, cuttings, and transplants distributed from the nursery stations at Indian Head and Sutherland, Saskatchewan, and the work has grown to such proportions that during the spring of 1926 over 5,500,000 seedlings and cuttings of such varieties as maple, ash, caragana, poplar, and willow were sent out. In addition to these broadleaf varieties over 50,000 evergreen spruce and pine trees were distributed at nominal cost for general farm planting and about 60,000 for planting on forest reserves in Manitoba and Saskatchewan.

The progress of this important work will be better realized by a brief statement of the results obtained since it was inaugurated in 1901. The first distribution consisted of 58,800 seedlings supplied to 47 farmers in Manitoba and the Northwest Territories. In 1902 this was increased to 466,000 plants to 496 farms. The demand grew rapidly in subsequent years and in 1916 the number sent out had reached 4,460,000. Since then the annual distribution has continued between four and a half million and five and a half million, the total distribution for the twenty-five year period being 87,205,000 trees to 80,300 farmers scattered over the three Prairie Provinces.

During recent years the distribution has been carried on from two stations, Indian Head making shipments to southern Manitoba, Saskatchewan, and Alberta, and Sutherland to the northern districts. Careful check is kept of all material sent out until the plantations can be considered as fairly well established and no trees are allotted to an

(Continued on page 4)

## RAPID INCREASE IN MOTOR TRAVEL IN CANADA\*

Extension of Good Roads Attracts Both Domestic and Foreign Tourist Traffic—Number of Passenger Cars

During recent years there has been a rapid development in motor travel, both domestic and foreign, in Canada. With the motor car within the reach of thousands of all classes, the almost universal desire to travel is being grati-

According to figures collected by the Department of Customs, 2,439,144 cars were admitted to the Dominion for periods of from one day to six months. The visitors for twenty-four hours totalled 1,945,035 and of this number



Development of Motor Roads in Canada—A picturesque stretch of road in Nova Scotia approaching the Petite Rivière on the South Shore Highway.

fied. This is true in Canada as elsewhere and the appearance in the streets of one province of motor cars bearing the license plates of another province indicates the interest Canadians are taking in all parts of the Dominion and the growing realization of the recreational and scenic advantages of Canada. The number of motor cars in Canada has increased rapidly and last year there were 639,695 passenger cars registered in the Dominion, an increase of 12 per cent above the 1924 figure of 571,793.

The increased number of motor cars entering the Dominion for touring purposes also shows that Canada is coming into her own as a great tourist field.

\* Prepared under the direction of Mr. A. W. Campbell, Chief Commissioner, Canada Highways Commission.

(Continued on page 2)

## DEVELOPMENTS OF IMPORTANCE IN YUKON MINING\*

AREA ESTABLISHED AS PERMANENT PRODUCER

### Large Amount of Silver-Lead Ore in Sight—Yukon Treadwell Company Doubles Mill Capacity

The silver-lead mining industry of the Mayo district, Yukon Territory, has emerged from the prospecting stage and may now be considered on a permanent producing basis in the opinion of officers of the North West Territories and Yukon Branch of the Department of the Interior. The significant announcement made by the Treadwell Yukon Company, that it had been decided to proceed this year with the enlargement of the mill on their property at Wernecke to double its present capacity of one hundred tons per day, is taken to indicate that the turning point has been reached in the development of this area. This, coupled with the further statement that the company now has ten years ore in sight on their own property for the enlarged mill, is regarded as the most important announcement made so far with regard to silver-lead mining in the Mayo district.

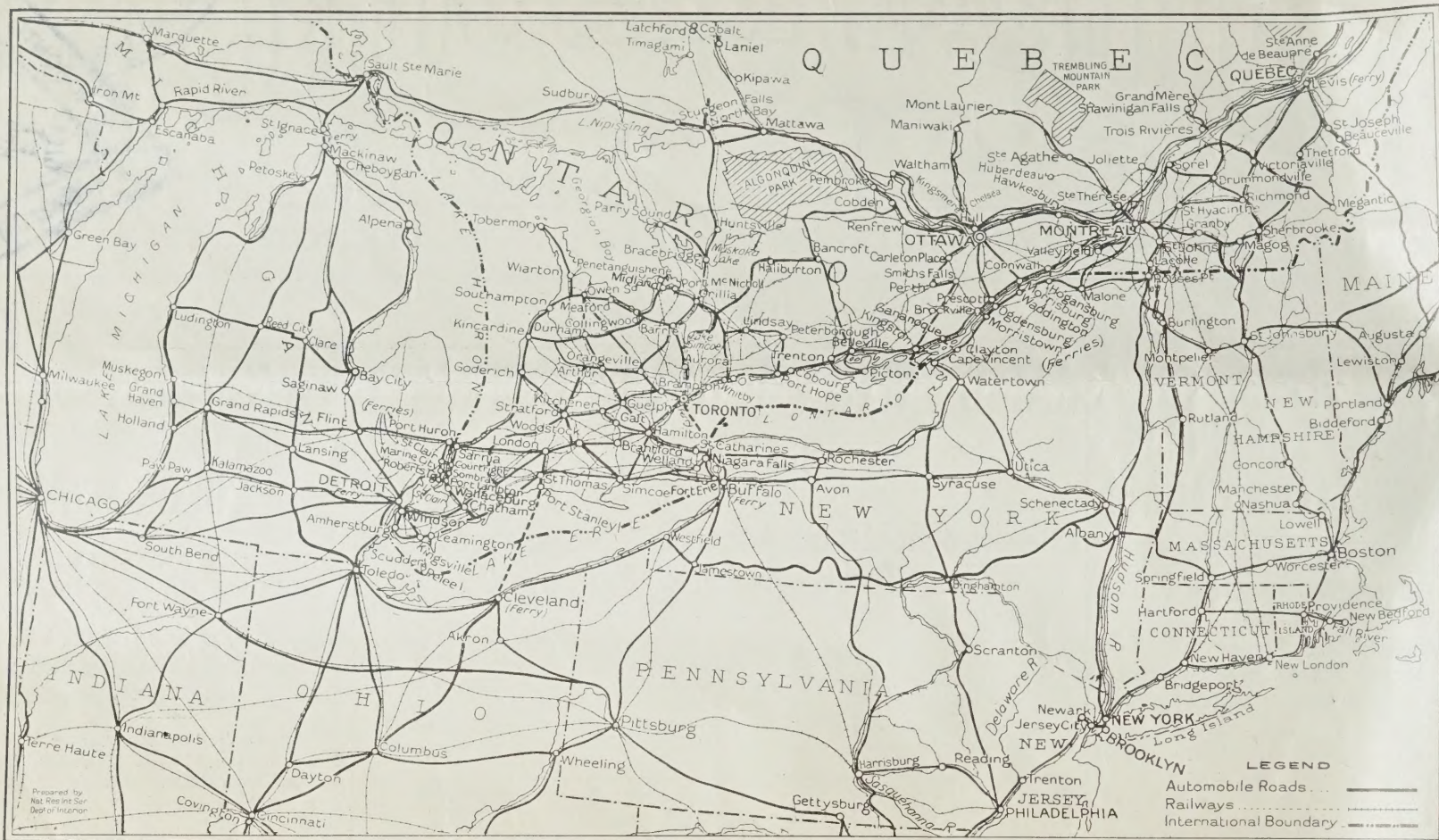
The Yukon Treadwell Company, which is the largest producer in the Yukon Territory, has been operating a group of claims, situated on the western slope of Keno hill, continuously since 1921. Their mill was placed in operation in 1925 and marked the first attempt to concentrate the Mayo ores before shipment. To the end of August, 1925, the Treadwell Yukon Company had shipped 1,135 tons of concentrates with an assay value of 584 ounces of silver to the ton and 52 per cent lead. A small amount of crude ore, which did not require concentration was also shipped. Haulage to the point of shipment usually takes place in the winter, the movement of the ore to outside points beginning in the spring. On that account only a small amount of concentrates is included in the total quantity shipped during 1925.

Although there were no discoveries of major importance during 1925, the development of established properties has been steady with gratifying results. Several properties on which ore had

\* Prepared from material supplied by the North West Territories and Yukon Branch, Department of the Interior, and the Geological Survey, Department of Mines.

(Continued on page 4)





Motoring in Canada—Map showing the network of motor highways in eastern Canada and the connections with the roads in the eastern United States. The accessibility of Ottawa, the Dominion Capital, is readily seen and it is expected that thousands of motorists will visit Ottawa this summer to take part in the Centennial celebration.

## THE CENTRAL ELECTRIC STATION INDUSTRY

Canada's resources in water-power are immense and by their wide distribution and accessibility are being made to serve an ever-increasing field. In many of the sections in which these water-powers occur, the development of hydro-electric power is proceeding rapidly and as a result the Dominion's central electric station industry—the generation and distribution of electrical energy for public use—has attained record proportions. Many if not most of the great sources of hydro-electric power adjacent to our cities and towns are in various stages of development and now, as the problems of long distance transmission are being solved, attention is being directed to the immense water-powers more removed from the centres of population.

The close relation of water-power to the growth of the central station industry is at once made evident when it is stated that almost 81 per cent of the total hydraulic installation of Canada is in central electric stations, and that over 95 per cent of all main plant equipment in central stations is driven by water-power. The growing application of electricity to industry has greatly accelerated the development of water-power. This is demonstrated by the fact that in the last five-year period, 1921-25, nearly 94 per cent of all new hydraulic installation was made in central stations while in 1925, the year of greatest increase to date, over 98 per cent of the new turbine capacity was installed for central station purposes.

In order that adequate knowledge of the development of water-power, one of Canada's greatest natural resources, may be available for public use, the Dominion

Water Power and Reclamation Service of the Department of the Interior co-operates with the Dominion Bureau of Statistics, Department of Trade and Commerce, in conducting an annual census of the central station industry.

The last completed census was for the calendar year 1924. Although the stations generating hydro-electricity represent only 70 per cent of the total number it should be borne in mind that they carried 95 per cent of the generating equipment and produced 98½ per cent of the electricity distributed. The low cost of hydro-power makes it possible to transmit it a considerable distance, with the result that hydro-electric stations operate over 97 per cent of the total transmission line mileage of 9,147 miles.

With the many new uses to which electricity is constantly being put in the agricultural, domestic and industrial life of the country there is every indication that the consumption of electricity will be increased not only by the growth of population and extension of lines but to an even greater extent by the increased demand of individual consumers.

The influence of hydro-electricity on the industrial life of the country makes itself felt in many ways. In any country where, as in Canada, the metallic minerals occur remote from the coal fields, the prosperity, in fact, in many cases, the possibility of mining depends on hydro-electric energy. In the pulp and paper industry the consumption of power is very great and the necessity for securing cheap power is imperative. In the domestic life of the country amenities are possible through the use of hydro-electricity which could not be obtained in any other way. Better street and building lighting and the use of many house-

## RAPID INCREASE IN MOTOR TRAVEL IN CANADA

(Continued from page 1)

tourist outlays in the Dominion in 1925 reached \$188,555,400, as compared with \$143,000,000 in 1924. The following table gives an idea of the value of this traffic to each of the provinces.

	No. of Entries 1 day to 6 mos.	Estimated Gross Outlays.
Alberta...	8,617	\$ 882,780
British Columbia...	123,738	26,500,820
Manitoba...	24,563	2,257,280
New Brunswick...	488,430	13,383,100
Nova Scotia...	694	451,200
Ontario...	1,521,277	97,973,400
Prince Edward Island...	20	24,000
Quebec...	255,914	45,873,460
Saskatchewan...	5,841	1,209,360
CANADA...	2,439,144	188,555,400

The increasing number of domestic motor cars and the growing foreign tourist travel have during the last few years directed increasing attention to our highways. Although the question of good roads is one which is dealt with by the different provinces, the Dominion Government under the Canada Highways Act, provided \$20,000,000 in 1919 as its share towards aiding highway development. By agreement with the provinces, the Federal authorities advanced forty per cent of the cost of approved projects and the provincial government concerned supplied the remaining sixty per cent. Under this scheme over 7,000 miles of trunk highways have been constructed. In many of the provinces, particularly in the East, road construction is being pushed and a system of repair patrolling has

hold and commercial appliances now available, the widespread use of which is dependent upon low-priced power have done much to raise the standard of living.

been adopted for over 21,000 miles throughout the Dominion. The total road mileage in Canada is estimated at 427,037, which includes both improved and unimproved roads. Of this total 245,650 miles are classified as passable earth and 126,818 miles as improved earth. There are 47,195 miles of gravel highway and 8,374 miles of macadam and concrete construction.

Both the direct and indirect benefits to be derived from good roads are enormous. Tourist travel whether domestic or foreign means a larger and wider circulation of money and a consequent direct benefit to the country. Indirectly in the quickened social relations, in the educative effects of travel, and in the promotion of a desirable community of interest in things Canadian, the benefits are incalculable.

## INCREASE IN REGISTRATION OF SILVER FOXES IN CANADA

Nearly 70,000 Pedigreed Animals Now on Live Stock Records

Close to 70,000 pedigreed silver foxes have been registered by the Canadian Live Stock Records since the inauguration of the work in 1919. With the announcement during 1925 that beginning on January 1, 1926, only those foxes which are by registered sires and out of registered dams are eligible for registration, there was a rush for registration before the books were closed to foundation stock, resulting in a great increase over previous years. In 1919 the first year of recording foxes, 805 pedigrees and 152 transfers were recorded; in 1924 the totals were 8,345 pedigrees and 5,002 transfers, while last year the figures were 36,297 pedigrees and 10,747 transfers. In all 66,900 pedigrees have been recorded since the beginning.



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OTTAWA, JULY, 1926

## INTERESTING DATA ON REMARKABLE CLASS OF STARS

DOMINION ASTROPHYSICAL  
OBSERVATORY CARRIES  
ON INVESTIGATION

Victoria B.C., Institution Studies Celestial  
Bodies Many Times Greater  
Than the Sun

The manifold activities of the Department of the Interior include certain scientific branches whose work at first sight seems far removed from practical uses such as are made of Canada's natural resources. But the history of past progress shows that the pure science of today is the applied science of tomorrow, and that no country with national ambitions for the future can safely relegate to others the solution of the scientific problems of the present. Even the study of physical conditions in the stars, which a century ago was one of the speculative problems of impractical dreamers, is today shaping its course towards the elucidation of a practical terrestrial problem—the constitution of matter.

The determination of the dimensions of the stars, in which the Dominion Astrophysical Observatory at Victoria, British Columbia, has specialized, is an interesting and important problem in astronomy. It may be of interest to give some idea of the sizes, temperatures, and other physical properties of a particular class of stars, technically called the O-type stars, recently investigated at Victoria. The methods of obtaining the dimensions of stars so distant that light travelling at the speed of 186,000 miles per second may take thousands of years in the journey and which even with the most powerful telescopes appear only as points of light, form interesting examples of how science attacks an apparently insoluble problem. While too technical for description here, it may be said that these methods can be applied only to double stars revolving around one another and depend upon the application of Newton's law of gravitation after the period and separation of the pair have been obtained by observation.



An aerial view of Ottawa, Canada, taken recently showing the heart of the Capital city in its mid-summer garb. To the left is the group of Parliament Buildings and immediately to the right may be seen the Chateau Laurier. In between runs the Rideau canal connecting with the Ottawa river at the left. Ottawa is celebrating its 100th Anniversary this summer with a programme of gala entertainments.

Before giving the results thus obtained, it may be well, in order to help in the realization of the startling quantities involved, to recall the dimensions of our sun, one of the thousand million stars of the universe but the star of which we have the most intimate knowledge and which serves as the standard of comparison. This tremendous furnace, the source of all life and energy on the earth, is an enormous sphere of flaming gases and vapours 865,000 miles in diameter, at a temperature on the outside of 10,000 degrees Fahrenheit, nearly four times that of molten iron. It contains 330,000 times as much matter as the earth and of the same kind, although wholly in the form of incandescent vapours.

Even this giant globe sinks into insignificance in comparison with the O-type stars, the hottest, brightest and most massive of the stars. They are very limited in number, less than one-tenth of one per cent of the whole, only about 50 being within reasonable range of the 72-inch telescope at Victoria. From these fifty, two have been selected to illustrate the dimensions of the class, both of them necessarily double stars in order to apply the method referred to above.

The first system, by far the most massive known, discovered and investigated at Victoria, consists of two enormous suns about 17,000,000 and 15,000,000 miles in diameter respectively of masses at least 86 and 72 times our sun, revolving around one another in 14.4 days at a distance apart of 60,000,000 miles. The second system, in some respects even more interesting, is second only in mass to the first, and its dimensions have been recently accurately determined at Victoria. It consists of two tenuous bodies of 20,000,000 and 13,000,000 miles in diameter, of masses 36 and 34 times the sun, revolving around one another in 3.5 days at a separation of the centres of 35,000,000 miles. The tremendous gravitational pull between this close pair has made them elliptical in shape so that their innermost surfaces are in contact. According to modern views of stellar evolution, this pair has, as it were, only recently been born (technically, separated by fission, from the parent star) although the first system described is

considerably further advanced in development.

These stars are at temperatures on their outer surfaces of about 50,000 degrees Fahrenheit, 20 times that of molten iron, 10 times the electric furnace. The temperature at their centres must exceed 30,000,000 degrees so that they obviously emit energy at a tremendous rate, indeed each system shines with the light of at least 30,000 suns. From this known brightness it is a simple matter to deduce their distance which is such that light travelling from them to us will take about 10,000 years on the journey, a distance so great that no imaginable telescope can ever show them as double but their duplicity was found from their spectra.

While these are perhaps exceptional, there is good evidence that all the O-type stars are of the same order of dimensions and we may picture these bodies—and such a picture should impress us with the scale on which nature is constituted—as transcendent suns of flaming gases ten million miles or more in diameter, of a mass about forty times our sun, and with almost inconceivable temperature and brightness. If our sun were to be replaced by an O-type star, woe betide the earth. Ourselves and all organic matter would be immediately vapourized and in a very short time the earth would become a miniature sun of incandescent gas and be swept into the central orb.

The O-type stars occupy a unique place in the stellar system, are at the very apex or turning point in stellar development and indeed they may be considered as the full maturity of the super-giants in the family of stars. This investigation of their dimensions, distribution and motions is of great importance in the fundamental astronomical problem of determining the evolutionary processes at work in the stars and the constitution and scale of the universe.

The three hundred wapiti placed in Banff and Jasper National parks, Alberta, a few years ago have now increased to fifteen hundred. In addition to these there are 350 of this otherwise nearly exterminated animal in Buffalo park, Wainwright, and 220 in Elk Island park.

## ARCTIC EXPEDITION WILL SAIL JULY 14

Annual Patrol of Far Northern Posts Will  
Be Made by SS. "Beothic"

The 1926 annual expedition to Canada's Arctic archipelago will sail from North Sydney, Cape Breton island, on July 14. With this end in view preparations for the patrol are being completed by the North West Territories and Yukon Branch of the Department of the Interior. The cruise will be made this year in the S.S. *Beothic*, a sealing ship with a capacity of 2,700 tons and a speed of ten knots, which was chartered from the Jobs Seal Fisheries Company, Limited, of St. John's, Newfoundland, for this purpose. The vessel will be taken over by the department at St. John's and with its original crew will cross to North Sydney. The supplies and provisions for the posts will then be loaded as well as 1,500 tons of coal, after which the members of the expedition will embark.

Mr. George P. Mackenzie, of the North West Territories Branch, will again be the officer in charge. The other members of the expedition will be Mr. W. Q. Ketchum, secretary to Mr. Mackenzie; Dr. D. L. Livingstone, medical officer for the North West Territories Branch and the Department of Indian Affairs; Dr. L. J. Weeks, geologist, of the Geological Survey, Department of Mines; his assistant, Mr. M. Haycock; and seven members of the Royal Canadian Mounted Police, who go north to relieve other members of the Force coming out. Dr. Livingstone will make his fifth trip north with this year's expedition. During his brief stay at each post, Dr. Livingstone has been able to accomplish a considerable amount of medical work and his efforts among the Eskimo are gradually bearing fruit.

It is planned to make the first call on the northward journey at Godhavn, Greenland, and then to pick up Inspector Wilcox of the Royal Canadian Mounted Police, at Pond Inlet on the north coast of Baffin island, for the patrol of the posts. Dundas Harbour, on Devon island, Craig Harbour and Kane Basin cache, on Ellesmere island, and possibly Etah, North Greenland, will be visited in the order named; an attempt will be made to establish the post at Bache peninsula in Buchanan sea; and the usual patrol and investigatory work will be performed.

The restoration of Twin Falls in Yoho National park in British Columbia, was carried out last year. The obstruction which interfered with the action of one of the falls was removed, and a continuous flow of water over both falls is now assured.

By the construction of fifty-one steps and two platforms, an additional stretch of one hundred and fifty feet of the Nakimu caves, in Glacier National park, was opened up last year.

Farming operations conducted annually in Buffalo National park at Wainwright, Alberta, are of such proportions as to yield sufficient fodder for the domestic animals there and to provide ample seed, besides permitting substantial shipments to be made to meet similar requirements in other National parks.



## BIOLOGICAL BOARD PLANS YEAR'S WORK

### Investigations Bearing on Problems of Fishing Industry Outlined at Annual Meeting

Investigations having a direct bearing on economic problems of the fishing industry in Canada will be carried on by the Marine Biological Board during the current year. Plans and policies formulated at the annual meeting of the Board held at Ottawa recently include a large amount of work at the St. Andrews, New Brunswick, station, and Halifax, Nova Scotia, experimental station, on the Atlantic coast, and the Nanaimo station and Prince Rupert station in British Columbia, on the Pacific coast. Investigations into problems of the inland fisheries will also be engaged in.

The Biological Board functions under the Department of Marine and Fisheries and the following members attended the meeting: Dr. J. P. McMurrich, Toronto; Dr. E. E. Prince, Ottawa; Dr. Cox, Fredericton; Dr. McKay, Halifax; Dr. Hutchinson, Vancouver; Mr. John Dybhavn, Prince Rupert; and Mr. J. J. Cowie, Ottawa. Dr. Huntsman, Director of the Atlantic Biological Stations and Dr. Clemens, Director of the Pacific Biological Stations were in attendance.

Dr. A. P. Knight of Kingston, who for the last fourteen years filled the office of chairman of the Board, found it necessary to sever his connection with it. A resolution was adopted expressing the Board's high appreciation of the long and valuable services which Dr. Knight has given to the Board and of his interest and enthusiasm in biological research. Dr. J. Playfair McMurrich of Toronto University was elected chairman in Dr. Knight's place, while Mr. J. J. Cowie of the Fisheries Department, was re-elected secretary-treasurer.

The work planned for the year includes, on the Atlantic coast, the usual basic scientific work which is carried on at the station at St. Andrews; work of a more direct bearing on economic problems of the fishing industry at the Halifax Experimental Station; experimental work on salting, drying, smoking and brine freezing of fish; investigations connected with smelt, shad, and brook trout; also experimental work connected with lobster propagation by transferring fry to warm water areas. The tagging of cod and mackerel with a view to securing more definite information as to their movements will be continued during the summer.

In the inland parts, problems connected with sturgeon and whitefish and the planting of bass and ciscoes in the prairie lakes are to be investigated. Investigations covering the distribution of trout in the Jasper National Park lakes, the physical and chemical condition of the water of the lakes, the character of the vegetation and the forms and abundance of animal life therein will be continued.

On the Pacific coast basic scientific work will be carried on as usual at the Nanaimo station; while work more directly bearing on economic problems, such as fish refrigeration, will be continued at Prince Rupert, as will the investigation at Cultus lake in the Fraser River district to determine the



Development of Tree Planting in Western Canada—This picture shows how a Manitoba farmer succeeded in developing homelike surroundings on his prairie farm from materials supplied by the Forestry Branch nurseries.

### DEVELOPMENT OF TREE PLANTING IN WESTERN CANADA

(Continued from page 1)

applicant until inspection and inquiry indicate that land has been properly cultivated in preparation to receive the young trees. In most cases special plans are prepared in the office of the Tree Planting Division at Indian Head during the winter time for the guidance of the individual planters in the spring. This season some 3,297 plans were so prepared and during the summer the inspector will visit those who received trees to see that the stock has been properly planted and is being given reasonable care and cultivation.

The Tree Planting Inspectors started out on their annual trips over their respective territories in the latter part of May and about 11,200 farms are on their lists to be visited. A staff of eight inspectors will be engaged in this work until the winter sets in, each visiting an average of 1,400 prospective planters. Unfavourable weather conditions last year cut short the inspection period but reports show that 5,700 plantations were visited of which over 73 per cent were in first class shape, 20 per cent fair, and only a little over 6 per cent neglected. Those classed as fair could, with a little care and attention on the part of the owners, be put in good shape.

The effect of tree planting on the social and economic life of the Prairie Provinces is considerable. Shelter-belts have made the homestead more homelike and comfortable, while by checking the high prairie winds and conserving moisture the production of the farm is increased. The farmers of Western Canada quickly realized the value of planting trees and in the large and steady demand for material is seen their approval of this important work.

results respectively of artificial and natural hatching of sockeye salmon, on a sure knowledge of which depends to a great extent the question of restoring the Fraser river to its former productivity. Investigations will also be continued and extended in connection with clams, crabs, and oysters; attention will be given to the effects which the freshwater discharge from the Fraser river has on the course of salmon on their way in from the sea, and salmon tagging will also be carried on.

### DEVELOPMENTS OF IMPORTANCE IN YUKON MINING

(Continued from page 1)

previously been discovered were brought to the point of production.

On Galena hill, immediately to the west of Keno hill, the veins discovered in 1924 were prospected and several promising ore bodies have been found. On some of these ore as rich as any yet found in the camp has been located. One property, consisting of the Arctic and Mastiff claims, shipped 375 tons of high-grade ore. The ore on this group was encountered in a vein drifted on from the shaft at a depth of 38 feet and the ore shoot in the drift proved to be 90 feet long and 9 feet wide. Surface workings indicate that the ore body has been cut off by a fault and that the ore shoot may be expected to continue on the other side of the fault for a distance of 300 feet. Encouraging prospects have also been found on the Ruby, Coral, Wigwam, Elsa, Dragon and Hector claims.

In the more recently discovered Beaver River area, which lies about 45 miles in a northeasterly direction from Keno hill, some prospecting was done during the summer of 1925. In the autumn of 1925 the Consolidated Mining and Smelting Company had men on the ground, intending to take options on, and prospect some of the claims on McKay hill, the original point of discovery of silver-lead ores in Beaver River area. On account of the lack of transportation facilities, no shipments of Beaver River ores are expected, as it is believed that large ore reserves will have to be demonstrated before the expense of providing facilities for transportation can be justified. The ores of the Beaver River area are much lower in silver content than those in the area around Keno hill. The action of the Consolidated Mining and Smelting Company in prospecting these claims, will, however, undoubtedly encourage the holders of surrounding claims to greater efforts, and will serve to attract additional prospectors to the field, so that further discoveries may be confidently awaited.

Mount Rundle Camp, situated at Banff, Alberta, in Banff National park, is one of the best equipped motor camps in Western Canada. From 73 registrations in 1917, the total number of permits issued increased to 4,186 in 1925.

## CANADA'S IMPORTANCE AS A GOLD PRODUCER\*

### Dominion's Position Enhanced by Recent Discoveries—Steady Increase Continued in 1925

There has been a steady increase in the gold production of Canada during the last decade, due largely to the discovery of the new gold-fields in northern Ontario. This rate of increase is likely to be sustained for some years to come not alone because of the production that will come from properties now undergoing development but also because of production from the new Rouyn fields in western Quebec, and from the newly discovered Red Lake area in western Ontario. Last year (1925) the total production in all Canada was 1,740,386 fine ounces of gold valued at \$35,976,970. Approximately 84 per cent of this production was obtained from the mines of Porcupine and Kirkland lake in northern Ontario, and 13 per cent from British Columbia.

Canada's total recorded production of gold since the year 1858 now amounts to \$580,786,381. The world's total production of gold has been declining since 1912, but the Canadian output is still increasing annually, and since 1922 Canada has stood third among the countries of the world as a producer of this precious metal. The present output is at the rate of nearly \$100,000 per day and this rate will probably continue to rise for some years.

The discoveries made in the Porcupine and Kirkland Lake areas during the period 1905-1920 have disclosed the most important new gold producing area found anywhere in the world during the last quarter century. The importance of Canada as a gold producer has been still further enhanced in recent years by the discoveries and development work now taking place in western Quebec and by the discovery of auriferous ores in the Red Lake district of Ontario last summer. The prospects in this country are still bright for further discoveries because of the immense unprospected territory underlain by ancient crystalline rocks in associations similar to those found in the producing areas.

\* Prepared under the direction of Dr. Charles Cammell, Deputy Minister of Mines, by A. W. G. Wilson, Ph.D., Mines Branch.

### COMMERCIAL FISH PRODUCTION IN WESTERN CANADA

The value of production of the commercial fisheries of the three Prairie Provinces and the Yukon Territory in 1925, as reported by the Dominion Bureau of Statistics, was \$2,380,526, an increase over the preceding year of \$307,591. Manitoba and Alberta show increases in value while slight decreases are shown for Saskatchewan and Yukon Territory. Pickerel, whitefish and tullibee, in the order named, are the principal kinds of fish in Manitoba; whitefish and trout in Saskatchewan; whitefish, pickerel and pike in Alberta, and salmon in the Yukon Territory. The catch of whitefish in the provinces and territory under review amounted to 115,520 cwt., valued at \$1,044,852. This value represents 44 per cent of the total value of the commercial fisheries of the provinces and territory.



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## IDEAL CONDITIONS FOR CANOEING IN CANADA

**Water Courses Throughout Dominion Have  
Many Attractions—A Typical Route  
Described**

No country in the world offers as much to the canoeist as does Canada: no country has the same combination of wealth of historic association, and suitable streams and lakes offering alternative routes and flowing through a virgin country of unknown treasures. But besides the strong imaginative appeal and beautiful and varied scenery, Canada enjoys an excellent summer climate—a primary requisite for an enjoyable canoe trip.

Early Canadian history and the development of the fur trade are closely connected with the water courses, for the explorations of early adventurers naturally followed the water routes, trails, and portages previously selected by the Indian path-finders; and to-day the lines of communication in the north still follow the tracks pursued by the Indians in their travels to new hunting grounds, or in their inter-tribal communications.

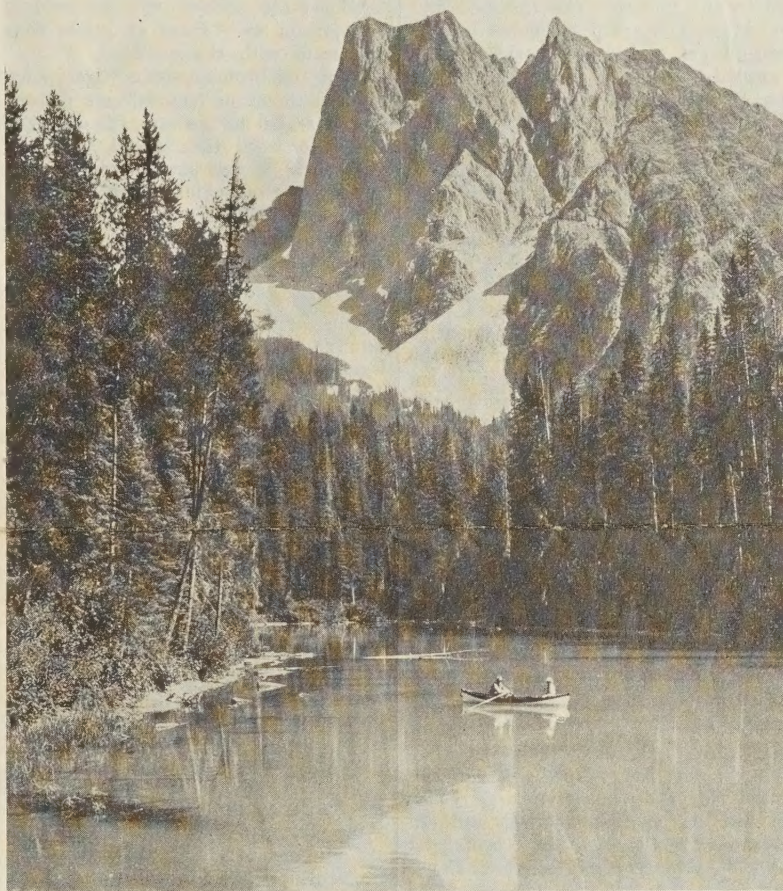
The craft, too, designed by the Indian for its buoyancy, its lightness in portaging, and its capacity to provide a cover quickly in case of need, was adopted by the white man and has remained the model upon which the unrivalled Canadian canoe is fashioned. Yet while the original idea of the Indian survives, improved methods of manufacture have produced a swifter, stronger and generally superior canoe to the primitive birch-bark model.

The canoeist can taste again the thrills and pleasures of the voyageurs and explorers, with the added advantage of being in a position to plan his route, from start to finish, beforehand, having available the accumulated experience of the many who have gone before. Whether he chooses a short 50-mile trip or travels by canoe from the mouth of the Mackenzie river on the shores of the Arctic ocean to the bay of Fundy—a distance of fully 4,500 miles—in either case he is able to secure exact information on the nature of the route he selects, and to work according to schedule.

The following outline of a trip in Algonquin park, Ontario, from Cache lake to Cedar lake, is a typical route selected from some 50 short trips designed by the Department of the Interior to assist the canoeist in spending his time most profitably and to enable him to get the full enjoyment out of his trip.

The detraining point for the trip is Algonquin Park station on the Canadian

(Continued on page 4)



Touring in the Canadian Rockies—Looking across beautiful Emerald lake toward stately mount Burgess in Yoho National park, British Columbia. The completion of the Lake Louise-Field highway has opened up the many beauties of Yoho park to the motor tourist.

## HEAVY EARLY SEASONAL TRAVEL TO PARKS

**Canadian Rocky Mountains Resorts Thronged with Visitors—Fine Weather and  
Good Roads Encourage Travel**

Each year brings an increasing number of tourists to the Canadian National Parks and the figures compiled up to early in July of the present season indicate that the fame and popularity of the great Rocky Mountains resorts in Alberta and British Columbia continue to spread. The 1926 season opened earlier than usual owing to the mild spring in Western Canada. The fine weather and the good condition of the motor roads helped to encourage travel with the result that many previous records for early seasonal travel have been broken.

During the week-end of May 22-24 nearly 2,000 motor cars passed through the Kananaskis or eastern gateway of the Banff-Windermere highway, surpass-

ing the previous record made during the week-end of September 5-7, 1925, by over 700 cars. At the two hot springs establishments maintained by the Dominion Government the number of bathers for the Victoria Day week-end totalled 3,668, or 850 more than for the same period in the previous year.

Returns from Kootenay and Banff national parks show that up to the end of June of this year, 1,151 motor cars had entered the western gateway of the Banff-Windermere highway at Sinclair Hot Springs, British Columbia, and 3,700 by the eastern entrance at Kananaskis, Alberta, making a total of 4,851. The records for the same period in 1925 were, western entrance, 764;

(Continued on page 4)

## POWER DEVELOPMENT IN ONTARIO AND QUEBEC

**Review of Past and Estimate of Future  
Hydro-Electric Installations  
in these Provinces**

There has been a rapid increase in water-power development in Canada during recent years. The low price at which hydro-electric power can be made available for industrial, agricultural, and domestic purposes has brought about a greatly increased use of electricity, and the growing demand, which has been mainly in the centres of industry in the St. Lawrence basin, has resulted in most of the major installations being undertaken in the provinces of Ontario and Quebec. On January 1, 1926, the total turbine installation in Canada was 4,290,428 horse-power, and of this total 3,532,228 horse-power was in stations and plants in Ontario and Quebec.

What proportions the development of water power will reach in these two provinces, and the approximate amount of new capital that will be required for that development are indicated by the results of a survey recently completed by the Dominion Water Power and Reclamation Service of the Department of the Interior.

In 1924 officers of the Service made an exhaustive investigation of the rate of growth of power demand, past and present, in the district termed "the Lower St. Lawrence Basin". This district includes practically the whole of the settled portion of the province of Quebec and of the southeastern or principal industrial portion of Ontario, and has a population of over 5,000,000. Nearly 30,000 industrial establishments and some 750 power-producing or power-using public utilities are located in this area; it is served by 27 railways, and has vast resources of timber, pulpwood, minerals, water-power, etc.

Quite recently the study was extended to ascertain the amount of new capital that will be required for water-power development to meet the demand for power for the whole of Ontario and Quebec. A reliable basis for the average capital cost per horse-power is furnished by the very complete Census of Central Electric Stations which has been compiled annually since 1917.

The net result of these two studies was that the estimated power required by the provinces of Ontario and Quebec will increase from 3,532,000 installed hydraulic turbine horse-power in 1925 to about 8,150,000 in 1945 and that the new capital required for development, transmission and distribution of this water-power will be not less than \$1,369,000,000 during the 20 years or an average of over \$68,000,000 per year.

That this estimate is conservative may be judged from the following facts. The

(Continued on page 3)



## FOREST PRODUCTS SHOW AN INCREASE IN 1924

Value of Dominion's Primary Output Placed  
at \$213,146,710

An estimate recently issued by the Dominion Bureau of Statistics, in collaboration with the Dominion Forest Service, shows that the total primary forest production of Canada in 1924 involved the cutting of 2,808,506,073 cubic feet of standing timber.

The value of the primary products of the forests in 1924 is estimated at \$213,146,710, an increase of 7.9 per cent over the 1923 total of \$197,459,331. These figures apply only to what may be classified as raw materials. Including the value added by further manufacture into lumber, lath, shingles, pulp, paper and other manufactured wood products, the total value of the forest products was approximately \$452,870,000. As in previous years logs and bolts for domestic manufacture—the raw materials of the saw-milling and allied industries—head the list with a total value of \$83,141,692. Pulpwood for use in the Dominion's pulp and paper mills comes second with a value of \$44,241,582. The value of firewood cut rose to \$39,336,771 and railway ties taken out had a value of \$14,251,450. Among the more important of the other items are pulpwood for export, \$13,536,058; telegraph and telephone poles, \$3,621,415; and square timber exported \$3,317,225.

The following tables show the primary forest production by products and by provinces for the year 1924:—

### By Products—Quantity

Product	Unit	Quantity
Logs and bolts sawn	M ft. b.m.	4,602,991
Pulpwood used..	Cords	3,316,951
Firewood..	"	9,117,680
Pulpwood exported..	"	1,330,250
Railway ties..	Number	16,038,283
Logs exported..	M ft. b.m.	288,384
Square timber exported..	"	127,773
Telegraph and telephone poles..	Number	785,654
Round mining timber..	M lin. ft.	52,343
Fence posts..	Number	13,826,713
Woods for distillation..	Cords	57,131
Fence rails..	Number	5,291,692
Miscellaneous exports	Cords	212,328
Miscellaneous products	"	80,879

### By Products—Value

Product	Value
Total..	\$213,146,710
Logs and bolts sawn..	\$83,141,692
Pulpwood used ..	44,241,582
Firewood..	39,336,771
Pulpwood exported..	13,536,058
Railway ties..	14,251,450
Logs exported..	4,855,298
Square timber exported..	3,317,225
Telegraph and telephone poles..	3,621,415
Round mining timber..	1,290,710
Fence posts..	1,414,363
Wood for distillation..	562,525
Fence rails..	452,377
Miscellaneous exports..	2,281,013
Miscellaneous products..	838,231

### By Provinces

	Equivalent volume in standing timber, cu. ft.	Value
CANADA..	2,808,506,073	\$213,146,710
Quebec..	883,431,884	68,597,165
Ontario..	760,725,859	64,911,097
British Columbia ..	618,579,218	42,732,541
New Brunswick..	240,630,113	20,519,580
Nova Scotia..	122,937,591	7,962,289
Alberta..	59,649,950	2,758,473
Saskatchewan..	49,896,400	2,093,505
Manitoba..	57,100,646	2,861,094
Prince Edward Island	15,554,412	710,637

## HIGH STANDING OF CANADIAN SEED\*

### Dominion-Grown Varieties Have Reputation for Vigour, Productiveness, and Early Maturing Qualities

"Northern-grown" seeds are much discussed by farmers and gardeners who do not live in the north. The term has come to imply unimpaired vigour, early maturity, and productiveness. Canadian-grown seeds enjoy a high reputation because of these qualities and because there has been established in Canada a system for standardizing seeds under grade names designated in the Seeds Act. The inspectors of the Seed Branch of the Department of Agriculture inspect seed crops for purity of variety at a cost of fifteen cents per acre to the farmer. The threshed and cleaned seed is again inspected by the same officers, and if of superior quality is graded, registered, and sealed in the sack for commerce.

#### CEREAL SEEDS

The quantity of Registered, Extra No. 1, and No. 1 grades of inspected seed grain produced in Canada is much in excess of domestic requirements, and large amounts of seed oats, barley, wheat, and rye are offered for export under seed inspection certificates. Because of having so large a quantity available in the domestic market the cereal crops in Canada during the past fifteen years have become greatly improved, with fewer varieties and the general use of seed that is true to a desirable variety.

#### GRASS AND CLOVER SEEDS

Alsike seed grown in Canada controls the world's prices for that commodity. The rich, moist, clay loam soils of Canada produce alsike seed of a quality unequalled by any other place in the world. The world's greatest centre of alsike seed production is probably Victoria county in the province of Ontario.

Heretofore red clover seeds have not been grown as extensively as they should have been. Northern varieties of red clover do not give large yields of seed as compared with southern clovers. Twenty to thirty cents per pound may be required to attract Canadian farmers to the production of red clover seed, whereas the farmers of Italy, Chile, and other southern countries may acquire wealth in the production of red clover seed at from twelve to fifteen cents per pound. This southern seed, however, though cheap, is not winter-hardy in our northern areas, and in future, under regulations recently adopted, the imported seeds will have to be stained green, or, if of extreme southern origin, red, so that farmers may protect themselves against purchasing them. In consequence the price for Canadian-grown red clover seeds during the next year or two is expected to be unusually high.

Under the Seed Branch service of field crop and seed inspection, alfalfa seed production has increased in twenty-five years from nothing to more than one hundred thousand bushels. Our exports from last year's alfalfa seed crop amounted to approximately seventy-five thousand bushels. The Ontario Variegated and the Alberta Grimm varieties of alfalfa seed are sought after in many countries because of their proven winter hardiness and superior quality for forage crop purposes.

\* Prepared under the direction of Dr. J. H. Grisdale, Deputy Minister of Agriculture, by Mr. George H. Clark, Seed Commissioner.

Grass seed production includes many kinds: timothy, western rye grass, brome grass, and, in recent years, that finest of turf grasses, browntop (*Agrostis tenuis*). Twenty-five thousand pounds of seed of this latter grass was produced last year on Prince Edward Island from inspected seed crops, and it is anticipated that this amount may be increased this year to sixty thousand pounds. Seed of No. 1 grade will yield approximately a dollar per pound. The No. 3 grade and other inferior qualities equal or superior to the imported stocks of the same species will be sold in competition with them at prices commensurate with the quality.

From the brome grass seed crop five hundred thousand pounds were inspected and sealed in the sack for export at a cost for seed testing and sealing of one-fifth of a cent per pound. Trading on the basis of an inspection certificate, as distinguished from a type sample certificate, would seem to be highly satisfactory to seed merchants.

#### FIELD ROOT AND GARDEN VEGETABLE SEEDS

Thus far the greater part of Canadian requirements of field root and garden vegetable seeds have been imported. Fifteen years ago a start was made by the Seed Branch to encourage the home production of these seeds. The work so undertaken was attended with success but was disrupted during the war. About thirty-five farmers and gardeners who have made a specialty of growing seed of one or more kinds of these crops have continued throughout, and during the last few years these have steadily increased in number. The province of British Columbia offers numerous local climates, and under ideal soil and moisture conditions the best quality of field root and garden seeds in the world may be economically produced in quantity for commerce.

The development of this industry will necessarily continue to be slow because it requires many years of special training on the part of the seed grower. Horticultural plant breeders at the various experimental stations in Canada have undertaken to provide elite stock seed specially bred and selected to fit into Canadian climatic conditions. It is to the multiplication of this stock seed that the seed growers in British Columbia and other parts of Canada will devote their attention. The steady development of this special industry is reasonably assured because the quality of the seed produced excels that of any other seed, and is particularly suitable for Canadian use.

A new Canadian record in lead output was established in 1925 when the recovery totalled 253,590,578 pounds, an advance of 44.5 per cent compared with the previous high record of 175,485,499 pounds set up last year, according to a statement issued by the Dominion Bureau of Statistics.

The town of Jasper, in Jasper National park, Alberta, is rapidly growing. The Canadian National Railways have built fifteen new bungalows of an attractive character, local residents are also erecting good houses, and on the business street several new stores have been put up which are of a pleasing appearance.

## ARCTIC PATROL MAKES REMARKABLE PROGRESS

SS. "Beothic" Carrying Canadian Expedition  
Nears Farthest North Stations

Wireless reports received by the Director of the North West Territories and Yukon Branch of the Department of the Interior, show the rapid progress being made by the ss. *Beothic* in the annual patrol of the posts in Canada's Arctic archipelago. The 1926 expedition, which sailed from North Sydney, Cape Breton island at noon on July 15, according to the most recent dispatches, has reached Dundas Harbour, Devon island. The ship will continue north to the posts on the east coast of Ellesmere island. The *Beothic* has also visited the Danish port of Godhavn, Greenland, and Pond Inlet, the post on Baffin island.

The reports, which are being sent by Mr. George P. Mackenzie, officer in charge of this year's patrol, indicate the satisfactory performances of the *Beothic*, the 2700-ton sealing vessel leased by the Department of the Interior from the Jobs Seal Fisheries Company, Limited, of St. John's, Newfoundland, for the 1926 expedition. The speed with which the *Beothic* is making her patrol is, however, only one of the remarkable features of this year's trip. The maintenance of wireless communication with stations to the south from points as far north as Dundas Harbour on the southeast coast of Devon island far surpasses the record of previous years and officials of the North West Territories and Yukon Branch state that it is not expected that the *Beothic* will be out of touch with civilization for more than two weeks. The greater amount of power available for radio broadcasting from the *Beothic* is given as the reason for the uninterrupted communication.

Sailing from North Sydney at noon on July 15, the *Beothic* reported on the 17th via the Louisburg wireless station that she had successfully navigated the strait of Belle Isle and was off the coast of Labrador. On the 20th the expedition had reached the coast of Greenland and at 1 o'clock on the morning of the 22nd the ship anchored in Godhavn harbour. At 4.30 p.m. the same day the *Beothic* sailed for Pond Inlet. The middle pack of ice in Baffin bay was navigated on the 24th and Pond Inlet was reached at 2 a.m. on the 26th. The *Beothic* sailed at midnight for Dundas Harbour, Devon island, which was reached at midnight on the 27th. Craig Harbour and Fram Havn, both on Ellesmere island will be visited before the expedition turns southward on the return journey.

At Godhavn, Greenland, the usual courtesies were exchanged between the officers of the Canadian expedition and the Danish officials, and arrangements were made for the relaying of wireless messages to the *Beothic* in case of necessity.

In the production of zinc for the year 1925 as reported by the Dominion Bureau of Statistics, Canada established a new high record with a total of 109,268,511 pounds (54,634 tons), valued at \$8,328,446. Compared with the 1924 output of 98,909,077 pounds (49,455 tons) valued at \$6,274,791 the increase amounted to 10.4 per cent in quantity and 32.7 per cent in value.



# NATURAL RESOURCES CANADA

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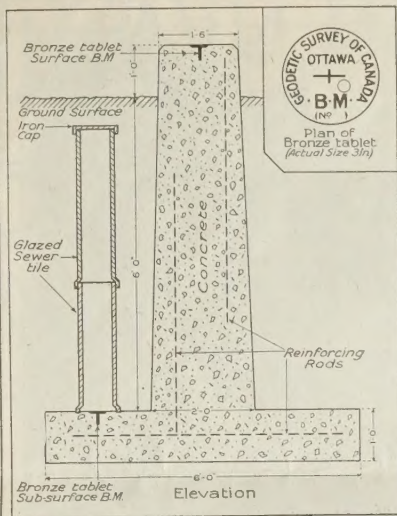
OTTAWA, AUGUST, 1926

## IMPROVED METHODS OF MARKING ALTITUDES

### Fundamental Bench Marks Being Erected in Public Parks—Greater Permanence Secured

No treasure is buried under the brass bolts placed by the Geodetic Survey of Canada to indicate elevations above sea level, technically called bench marks; nothing is to be found under them and the bolts themselves are of practically no commercial value. Notwithstanding this there are people who do not consider these facts and curiosity has been responsible for many of these bolts being dug out and destroyed. Yet a mark of some sort which can be found when wanted by surveyors and engineers must be established; otherwise all the careful work of the levelling engineer would be lost. Therefore the endeavour of the geodetic engineers of Canada and other countries is to improve the permanence of their bench mark monuments.

The causes which destroy bench marks may be classified as (a) mechanical, such as injuries from man and animals, frost, etc., (b) chemical, such as weathering, vegetation and decay, etc., (c) physiographical changes, such as movement of rivers, drifting sand and encroachment of the sea. By far the most destructive agency is man. In addition to pure curiosity and vandalism, there are many other deeds of man which result in bench marks being sacrificed. Roads are widened, railways are double-tracked, buildings are altered. The precise leveller has been incessantly on the alert trying to solve the problems of placing bench marks where the chances of destruction would be minimized. In the early days of the Geodetic Survey of Canada experience taught him that the best safeguard against vandalism was an inconspicuous bench mark. Thus for years the standard bench mark of this Survey was a small bronze bolt  $\frac{3}{4}$  inch in diameter and 3 inches long, set vertically or horizontally in a permanent structure. Such a mark set flush with the surface of a stone foundation is certainly not conspicuous and, if left alone, should be permanent for the life of the building. Indeed after the weathering of a season or two it is often impossible to find, unless the seeker is in possession of the exact description. However this inconspicuous bench mark, while it did secure a longer life, yet by its inconspicuousness was in a fair way of defeating the main object of this



Elevation of fundamental bench-mark. Inset—Drawing showing markings on standard tablet.

survey, namely, service. To overcome this objection the use of this type of bolt was discontinued some years ago, and was replaced by a bronze tablet, 3 inches in diameter, with the following words in bold type "B. M. Geodetic Survey of Canada, Ottawa".

This was a step forward, but it was found necessary to go further in making bench marks more permanent. For many reasons precise levels in Canada, with very few exceptions, have been run along railways. Experience of the older surveys has shown that the passing of trains produces an incessant state of vibration, and this in the course of years results in a progressive vertical movement of an adjacent bench mark. In other words, railway routes, while being the most suitable for precise levelling, are not the most suitable lines for bench marks.

Last season the Geodetic Survey inaugurated the erection of a new class of bench mark of the very first order. These monuments by their location and conspicuousness have proved more useful to the public and through their permanency will increase the life of the Canadian precise level system. It is not intended that these fundamental bench marks will replace the standard bench marks, which are placed every three or four miles along every line of levels. It is anticipated, however, that ultimately one of the fundamental monuments will be found in every city and in most of the larger towns of the Dominion. Unusual care is exercised in the selection of location, and whenever possible these fundamental bench marks are located in public parks. The Survey of India, which has been in operation for well over a century, reports that their most permanent ground points have proven to be those on memorial monuments. When erected in a public park, permission is first obtained from the proper local authorities, and the municipal engineer is requested to maintain a general supervision over the bench mark for its future welfare. One regulation regarding its location is that it shall not be built within a half mile of a railway. The monument is made of concrete reinforced with steel rods. From a massive circular base six feet in diameter and a foot thick, a pier rises until it projects a foot above ground level. The top of the pier is 18 inches square. The base of the monument is placed six feet below the surface, except when resting on bed rock, in which case this depth may be less. Each fundamental bench mark has a surface mark which is the standard tablet placed in the top of the pier, and also a subsurface mark, being a tablet placed in the top of the base and

## DISTRIBUTION OF FRY REACHED HIGH FIGURE

Dominion Government Fish Hatcheries  
Have Shipped About 680,000,000  
this Season

Close to 680,000,000 fish fry have been distributed this season from the hatcheries operated by the Dominion Government according to a statement issued by the Fish Culture Division of the Department of Marine and Fisheries. Approximately 700,049,882 fry were ready for distribution at the opening of the season and of this number slightly over 21,000,000 fry still remain to be distributed. Shipments are continuing and by the end of the season all the fry will be planted.

The following figures show the distribution by species so far this year:—

Species	Distribution
Atlantic salmon.. . . .	5,439,841
Landlocked salmon.. . . .	87,035
Rainbow trout.. . . .	15,276
Cutthroat trout.. . . .	116,440
Steelhead salmon.. . . .	219,944
Kamloops trout.. . . .	1,576,000
Lochleven trout.. . . .	205,487
Brown trout.. . . .	164,295
Sockeye salmon.. . . .	75,694,823
Spring salmon.. . . .	621,884
Coho salmon.. . . .	793,170
Speckled trout.. . . .	3,208,119
Whitefish.. . . .	478,521,750
Salmon trout.. . . .	18,174,650
Cisco.. . . .	1,362,000
Pike.. . . .	92,845,000

Total.. . . . 679,045,714

## PRODUCTION OF CHEESE AND BUTTER HIGHER

Nearly all Provinces of Dominion Report  
Substantial Increases During 1925

Generally throughout Canada the production of creamery butter and factory cheese was higher during 1925 than in 1924 according to the preliminary report issued by the Department of Agriculture. The total output of creamery butter last year is estimated at 180,663,783 pounds as compared with 178,893,937 pounds in 1924. The production of factory cheese rose 12.2 per cent from 149,707,530 pounds in 1924 to 168,068,894 pounds in 1925. All the provinces showed an increase in butter production except Alberta. Prince Edward Island and Alberta recorded decreases in the cheese output.

The figures by provinces for 1925 were as follows:—

Province	Butter Lbs.	Cheese Lbs.
P. E. Island.. . . .	1,583,131	2,001,191
Nova Scotia.. . . .	4,504,156	34,856
New Brunswick.. . . .	1,232,927	1,112,894
Quebec.. . . .	59,942,883	52,973,141
Ontario.. . . .	60,081,141	109,245,405
Manitoba.. . . .	13,663,312	765,407
Saskatchewan.. . . .	15,946,233	236,000
Alberta.. . . .	19,500,000	1,375,000
British Columbia.. . . .	4,210,000	325,000
Totals.. . . .	180,663,783	168,068,894

accessible from the surface by means of a tile pipe. The top of this tile is, however, not exposed at the surface. If, for any reason, the surface bench mark is injured, the elevation is not lost, but can be restored by means of the subsurface mark. To render these conspicuous bench marks more useful to the public, and to avoid delay in writing to Ottawa, their elevations above mean sea level will be stamped in legible figures on the tablet.

## STUDY BEING MADE OF REINDEER INDUSTRY

Canadian Government Investigating Possibilities of Introducing this Animal  
into Northern Canada

Entirely aside from the humanitarian aspect of the matter all authorities are agreed that the development of the far northern parts of Canada is dependent upon the maintenance of a healthy and vigorous native population. The experience of the Danish authorities in Greenland and of the United States Government in Alaska has shown that there are important revenue-producing industries to be developed which will also provide the natives with a profitable occupation suited to their condition and mode of life. In the successful efforts that have been made to meet the change caused by the depletion of wild life, the aim has not been to make the Eskimo into a white man, dependent upon support from without, but by wise direction to enable him to progress as a happier, healthier and more prosperous Eskimo.

In Greenland advancement has been made along diversified lines of industry: in Alaska the chief avenue of progress has been through the introduction of reindeer. As Alaska is contiguous to Yukon and the Mackenzie valley, the Government of Canada, through the North West Territories and Yukon Branch of the Department of the Interior, is now investigating the reindeer industry in Alaska, with the object, if possible, of introducing this animal into the northern part of the Mackenzie district which is the home of a considerable portion of our Canadian Eskimo population. Before embarking on a project of such magnitude it is necessary to ascertain whether the northern part of Mackenzie district is a suitable range for reindeer and also to secure first-hand information as to the methods of reindeer herding and management which have made the industry so successful in Alaska. With these ends in view the Department of the Interior, with the consent of the United States authorities, has sent two experts to Alaska who will make an investigation of the reindeer situation there in all its aspects and who will then travel on foot through the Arctic coastal region to Aklavik in the Mackenzie River delta and thence easterly to Coronation gulf and Chesterfield inlet, noting as they proceed the best route for the driving of a herd of reindeer, should the plan be found feasible. In all this northern district they will make a thorough study of the plants of the region to ascertain whether the supply of fodder is sufficient, and also report on all the other conditions necessary to the successful raising of reindeer.

## POWER DEVELOPMENT IN ONTARIO AND QUEBEC

(Continued from page 1)

average rate of increase in installed horse-power corresponding to the above figures is less than 5 per cent per annum; the actual increase from 1923 to 1925 has been at the rate of over 18 per cent per annum, and with the great developments on the Saguenay and Gatineau rivers, and smaller developments at other points, now under construction, and the developments that may be expected on the St. Lawrence, Ottawa and other rivers in the next few years, a similar rate may be expected for some years to come.



## HISTORIC SITES BOARD HOLDS ANNUAL MEETING

Many Sites Reviewed and Twelve Selected  
as Being of National Importance

At the annual meeting of the Historic Sites and Monuments Board of Canada, held recently in Ottawa, it was reported that 130 sites had been reviewed during the year and that in addition to the several sites previously recommended for commemoration twelve others were selected as being of national importance. The Board, which is an honorary body comprised of recognized historians, acts in an advisory capacity to the Dominion Government on historic sites matters. The administration of historic sites set aside on the recommendation of the Board is carried out by the Department of the Interior through its Canadian National Parks Branch.

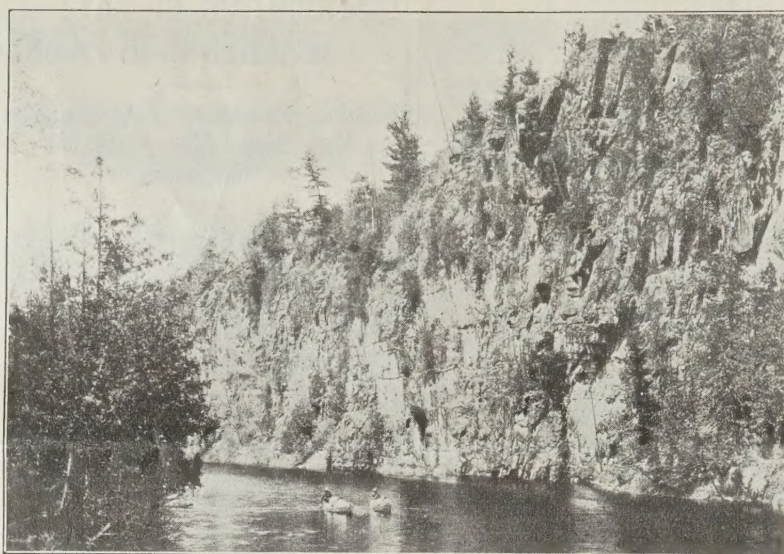
Brigadier-General E. A. Cruickshank presided at the meeting and the other members in attendance were: Dr. J. C. Webster, representing New Brunswick; Dr. J. H. Coyne, representing Ontario; His Honor Judge F. W. Howay, representing Western Canada; Mr. J. B. Harkin, Commissioner of Canadian National Parks, representing the Department of the Interior; and Major A. A. Pinard, secretary.

The more important of the places and events selected for commemoration at this year's meeting of the board include, Louisburg, N.S.; the naval battle of the *Shannon* and *Chesapeake* at Halifax, N.S.; the Yorkshire settlement at Chignecto, N.S.; Fort Lennox on Ile-aux-Noix, near St. Johns, Que.; Fort Three Rivers, at Three Rivers, Que.; Fort Frontenac, Kingston, Ont.; the embarkation point of Brock's troops to capture Detroit in 1812, near Sandwich, Ont.; the western terminus of Sir Alexander Mackenzie's farthest point west, near Bella Coola, B.C.; and the old Hudson's Bay Company's posts of Fort Augustus and Fort Edmonton, near Edmonton, Alberta. In addition to the above sites, it was also decided that the eminent public services of the following outstanding personages in Canadian history should be suitably commemorated: Nicholas Denys, at Bathurst, N.B.; Joseph Wallet des Barres, at Sydney, N.S.; Sir Howard Douglas, at Fredericton, N.B.; Bishop Alexander Macdonell, at St. Raphael, Ont.; and Sir Charles Bagot and Lord Sydenham, at Kingston, Ont.

The work of selecting for commemoration historic sites of national importance is steadily growing and as the recommendations are approved the sites are being acquired by the Department of the Interior. Eventually it is hoped that every historic site of national importance and interest in the Dominion will be marked to be handed down to future generations and keep green the stirring romance of Canadian history.

Kootenay National park, British Columbia, is being rapidly developed by the opening up of townsites and campsites along the Banff-Windermere highway. A townsite has been set apart in the vicinity of Marble canyon, and another at Radium Hot Springs, and a number of applications for lots have been made at both places.

In Jasper National park, Alberta, there are about 640 miles of standard trails by which tourists may visit the outlying scenic attractions.



Canoeing in Canada—A party of canoeists passing The Capes on the Petawawa river in Algonquin provincial park, Ontario. The Petawawa river is near the end of the canoe trip described in the accompanying article.

## IDEAL CONDITIONS FOR CANOEING IN CANADA

(Continued from page 1)

National Railway line. It is 200 miles northeast of Toronto and 167 miles west of Ottawa. There are hotels and outfitting stores at Cache lake and Joe lake; canoes and, if necessary, guides can be readily obtained.

Most of the portages are well marked, easy to travel and short. Many excellent camp sites, already prepared, are to be found along the route.

Detraining at Algonquin Park station on Cache lake, where Park Headquarters and the Highland Inn are situated, the canoe is launched close to the tracks and the route leads westward through White lake, Little Island lake, Kootchie lake, Smoke lake and Canoe lake to Joe lake. Between these lakes six easy portages are made before Joe Lake station and Hotel Algonquin, ten miles from the starting point and the last place at which supplies can be purchased, are reached.

Continuing up Joe lake, the canoeist passes into Little Joe lake, and thence through a long winding stream into Baby Joe lake. A paddle of a few hundred feet and a couple of short portages lead into Island lake. A few miles farther on Island lake contracts at the Narrows and then widens out with many long arms and picturesque islands. From the last expanse of the lake a half-mile portage leads to Little Otter Slide lake and thence to Otter Slide lake itself, twenty miles from Algonquin Park station.

From Otter Slide lake the mouth of a winding and sluggish stream is entered and after a course of six miles with numerous short portages White Trout lake with its many islands, wide bays and deep arms is reached. The route then leads through Longe, Red Pine, and Burnt lakes, thence over an easy portage to the long and narrow Perley lake. Three easy portages lead to Catfish lake which is about 4 miles in length with numerous islands and bays. At the end of Catfish lake a short portage brings the canoeist into Narrow lake and after a paddle of a mile and a half there is a hilly portage of one and a half miles before the canoe is launched in the Petawawa river. Another paddle of two miles, another portage, a further short paddle, and then comes the last portage which ends on the shore of Cedar lake. Two miles across the lake is the station of Brent on the Canadian National Railways. The total distance covered is 56 miles.

Further details of the above route and maps and details of various other canoe trips will be supplied upon request to the Natural Resources Intelligence Service, Department of the Interior, Ottawa, Canada.



CACHE LAKE TO CEDAR LAKE CANOE TRIP

## HEAVY EARLY SEASONAL TRAVEL TO PARKS

(Continued from page 1)

eastern entrance, 2,591; total, 3,355. Allowing an average of four persons to a car this means that this season nearly 19,500 visitors entered these parks by motor up to July 1. The number of bathers shows a correspondingly large increase. The attendance at the Banff hot springs for the same period totalled 17,647 or 3,282 more than last year.

The first two weeks in July have shown a similar heavy traffic and during the week-end of the 11th and 12th new records were again established for motor travel. Nearly 300 cars took out permits for camping at the Mount Rundle government campsite while thousands of visitors filled the hotels and lodging houses. During the same two days there were approximately 3,774 bathers at the government hot springs.

Similar reports of heavy travel have been received from Waterton Lakes and Jasper national parks while the opening of the new Lake Louise-Field highway is bringing hundreds of motorists to Yoho park.

## ORNITHOLOGISTS MEET IN OTTAWA THIS YEAR

American Union Will Hold Conference in  
October—First Meeting Outside  
United States

The American Ornithologists' Union, the foremost ornithological society in America, will meet at Ottawa, October 11 to 14, 1926. The Union has accepted the invitations of the Government of Canada and the Ottawa Field Naturalists' Club, the local scientific organization, and for the first time the Union will meet outside of the United States. The place of meeting will be the Victoria Memorial Museum, Canada's national museum, and all sessions except the business meeting on the first day, will be open to the public. The arrangements at Ottawa are in charge of a committee of local members of the Union, consisting of Mr. P. A. Taverner, Chairman, Dr. R. M. Anderson, and Mr. Hoyes Lloyd, Secretary. This committee is co-operating with the committee of the Ottawa Field Naturalists' Club, of which Mr. C. L. Patch is chairman, and Dr. R. E. DeLury and Mr. Norman Leach are the local members. Out-of-town members of the club have been selected on this committee as follows:—

**Nova Scotia.**—Mr. R. W. Tufts, Wolfville; Mr. Harry Piers, Museum of Natural History, Halifax.

**New Brunswick.**—Mr. W. McIntosh, Museum of Natural History, St. John.

**Quebec.**—Mr. R. Meredith, N.P., Quebec; Mr. L. McI. Terrill, St. Lambert.

**Ontario.**—Mr. A. B. Klugh, Kingston; Mr. J. H. Fleming, Toronto; Mr. R. O. Merriman, Hamilton; Mr. W. E. Saunders, London.

**Manitoba.**—Mr. A. G. Lawrence, Winnipeg.

**Saskatchewan.**—Mr. F. Bradshaw, Game Commissioner, Regina.

**Alberta.**—Mr. Frank Farley, Camrose.

**British Columbia.**—Mr. J. A. Munro, Okanagan Landing; Mr. F. Kermode, Director, Provincial Museum, Victoria; Mr. Kenneth Racey, Vancouver.

The meetings of the Union in Ottawa will begin with a closed session for business on Monday, October 11. The next three days' sessions will be open to the public, while excursions to points of interest in and around the Capital have been arranged for the remainder of the week. An exhibition of paintings and drawings of birds and bird life will be held in conjunction with the meetings. Those interested in bird life may secure additional information regarding the Union meetings by applying to the Secretary of the Union committee, Mr. Hoyes Lloyd, Canadian National Parks Branch, Department of the Interior, Ottawa.

The Canadian National Railways has laid out a first class eighteen-hole golf course in Jasper National park in close proximity to the town of Jasper. This with the older established eighteen-hole golf course at Banff and the nine-hole course at Waterton Lakes National Park, affords the votaries of the game an opportunity of playing on three courses in the midst of unequalled scenery and environment.

Radium hot springs in Kootenay National park, British Columbia, are yearly becoming more popular as their health-giving properties are more fully appreciated by the public. The total number of bathers last year was six thousand.



# NATURAL RESOURCES CANADA

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No.

## DEVELOPMENT OF ROUYN DISTRICT IS PROGRESSING\*

### ACTIVITY IN NEW QUEBEC FIELD

#### Mining Operations Being Carried On— Other Developments Await Railway's Completion

The rate of progress in the Rouyn mining district, Quebec, is indicated in reports recently received from Dr. H. C. Cooke of the Geological Survey. In addition to the mining operations being carried on at the more important properties, assessment work and detailed exploration are being done on most of the groups of claims within the possible copper-bearing area. The district to which attention is particularly directed at present is the great triangle whose corners are the Horne property on the south, the Waite-Montgomery claims on the north, and the Alderson-MacKay discoveries 8 or 9 miles to the west of the Horne. Many companies, among which might be mentioned the Consolidated Mining and Smelting Company, Area Mining Company, Duprat Mines, Stadacona, and the Victoria Syndicate, have one or more prospecting parties in this district. Roads and trails have been cut, and small creeks cleared of logs and brush to permit the passage of canoes, so that most of this once inaccessible district can now be traversed without undue difficulty. A telephone line has recently been erected to connect the various camps with each other and with the outside world, so that one can now lift a receiver in Toronto or Montreal and obtain the latest news from any of the principal camps.

Developments other than prospecting are largely marking time pending the completion of the railway, which is being rapidly pushed, although delayed considerably by the unseasonably wet weather. The grading is now well under way, and it is expected that the rails will be laid into Rouyn by the 15th of November.

The road under construction by the Quebec Government from Makamik to Rouyn is in much the same condition. The north half has been graded and surfaced, and is now in use, and work on the south half is being pushed as rapidly as possible.

\*Prepared under the direction of Dr. Charles Cammell, Deputy Minister of Mines, Canada.

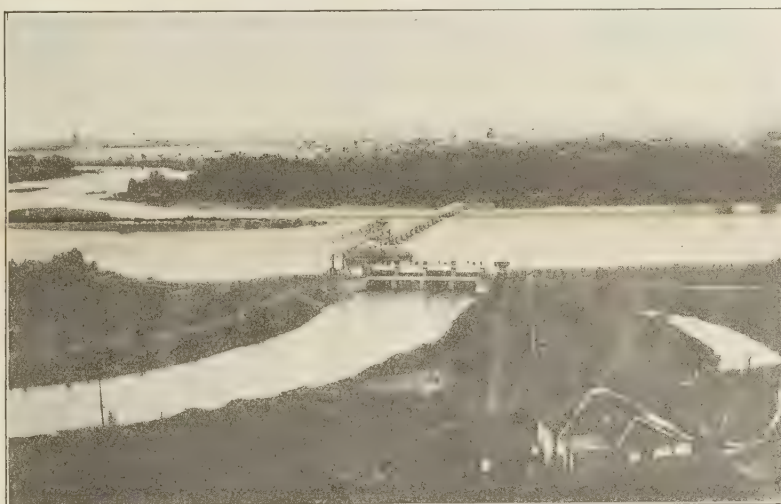
(Continued on page 4)

## IRRIGATION DEVELOPMENT IN ALBERTA

### Irrigable Area Under Schemes in Operation Totals 1,293,120 Acres—Location of Projects

Irrigation on modern lines in Alberta dates back to 1891 when considerable tracts of land were reclaimed by the use of the waters from Sheep creek. In the following year more extensive developments were undertaken and

1894 carried out extensive surveys which have resulted in the construction of a number of large projects. The following table shows the projects now in operation or under construction in the province:—



Irrigation Development in Alberta—View of Calgary and the Bow river showing the diversion weir which serves the project known as the C.P.R. Western Section. The main canal may be seen in the left foreground.

since then there has been a gradual increase in the number of irrigated farms, so that at present the irrigable area under the schemes in operation totals 1,293,120 acres.

The first attempt at irrigation in Alberta was made on Fish creek, about eight miles southeast of the city of Calgary, in 1879. Other attempts were subsequently made but none of the systems constructed at that time seems to have been successful. In 1891, however, Mr. John Quirk, by means of his scheme on the north fork of Sheep creek demonstrated the advantages of irrigation, with the result that a number of schemes were constructed to supply water from that stream.

Work on a larger scale was commenced in 1892 by the Alberta Railway and Irrigation Company and so prosecuted that the present canal system, now operated by the Canadian Pacific Railway as its Lethbridge section, is serving farmers on some 80,000 acres of land in the Magrath, Raymond, and Lethbridge districts.

By virtue of powers and responsibilities conferred by the Irrigation Act, the Department of the Interior has since

Project	Source	Area	
		Irrigable	Irrigated to date
	river	acres	acres
C.P.R. Lethbridge.....	St. Mary.....	130,000	81,110
C.P.R. Western.....	Bow.....	218,980	49,752
C.P.R. Eastern.....	Bow.....	400,000	93,375
Canada L. & I. Co.....	Bow.....	202,640	10,174
Taber I.D.....	St. Mary.....	17,000	13,863
Lethbridge Nor. I.D.....	Oldman.....	105,000	45,016
United I.D.....	Belly.....	36,000	7,230
New West I.D.....	Bow.....	4,500	3,552
Raymond I.D.....	St. Mary.....	68,000	.....
Magrath I.D.....	St. Mary.....	51,000	.....

In addition to these larger projects there are 496 small individual schemes within the province, for which water has been appropriated. The combined irrigable area in these smaller schemes is about 60,000 acres.

Following the success achieved by the pioneer schemes the Canadian Pacific Railway Company in 1904 commenced construction on what is now known as its Western Section. Water was first delivered to some of the settlers in 1908 and construction was

(Continued on page 2)

## AIR PROGRAM BEING CARRIED OUT THIS YEAR

### WORK OF ROYAL CANADIAN AIR FORCE

#### Aviation Playing Greater Part in Exploration and Conservation of Our Natural Resources

Aviation is playing a greater part each year in the exploration of the natural resources of the Dominion and also in the conservation of these resources.

Air transport is now recognized as one of the methods of solution of some of the most pressing problems of the forester, surveyor, geologist and explorer in their work in the more remote parts of the country. In the past six years great strides have been made, and flying now plays an important part in the work of many government services.

The 1926 program of the Royal Canadian Air Force in civil operations for government departments includes the following work:—

#### DEPARTMENT OF THE INTERIOR

**Forest Service.**—In southwestern Alberta fire detection is provided by means of land machines which fly over the Rocky Mountains forest reserve from near the International Boundary to the Saskatchewan river. In Manitoba the aeroplane functions both in the detection and suppression of fires in the lake country lying east, north, and northwest of lake Winnipeg, extending over into Saskatchewan. In these districts aircraft afford valuable means for forest sketching, type mapping, and aerial photography generally.

**Topographical Surveys Branch.**—Vertical photography in connection with the mapping of the Rouyn mineral area, Quebec (in conjunction with the Geological Survey, Department of Mines). Oblique photography for mapping the Trout Lake, Lake St. Joseph, Sioux Lookout, Armstrong and Quetico sheets of the Topographical Map of Canada; portions of the Battleford, Prince Albert and Fort Alexander sheets; vertical photography in the vicinity of Vancouver, British Columbia; Calgary, Alberta; and Oka, Quebec.

**Canadian National Parks.**—Fire detection patrols in the Waterton Lakes area and occasional patrols in Rocky Mountains park. Oblique photography over sites of historical interest, as other operations permit.

(Continued on page 3)



## ALPINE CLUB HOLDS SUCCESSFUL CAMP

Tonquin Valley, Jasper National Park,  
Scene of Annual Outing—Stubborn  
Peaks Conquered

The Annual Camp of the Alpine Club of Canada was held this year in the Tonquin valley, Jasper National Park, on the shores of Moat lake, underneath the towering peaks of Bastion, Turret and Geikie of the Ram-part range. From this base camp, exploration parties worked in the virgin territory among the peaks in the upper section of the Athabaska valley.

Dr. J. W. A. Hickson, president of the Alpine Club of Canada, accompanied by Mr. Howard Palmer, president of the American Alpine Club, carried out an exploration trip during the course of which mount Fryatt, a peak slightly lower than mount Edith Cavell, was climbed together with mount Lapensee (10,200 feet), and an unnamed peak of about the same altitude. Much virgin territory was traversed on this trip and a number of lakes were discovered.

Parties working from the base camp were repulsed by the difficulties offered by mount Redoubt, while the ascent of mount Bastion witnessed the conquering of one of the most difficult peaks in the region. Mount Clitheroe (9,014 feet), near the narrows of Amethyst lake about the centre of the Tonquin valley, presented such obstinate resistance that it was deemed worthy of badge distinction for those who were successful in reaching the summit.

The honour of being the first woman to climb mount Leah, on the shores of Maligne lake, was won by Miss R. Ecaubert of Brooklyn, N.Y., who was a member of the party which made the ascent.

The resignation of Mr. A. O. Wheeler, since 1910 director of the Alpine Club of Canada, and his appointment as Honorary President in succession to His Excellency Baron Byng of Vimy, together with the election of Col. F. C. Bell of Vancouver as President, were the outstanding features of the annual business meeting.

## IRRIGATION DEVELOPMENT IN ALBERTA

(Continued from page 1)

completed in 1910. Practically all of the lands under this project have now been disposed of and are being farmed. Altogether eighteen miles of main canal and 1,451 miles of secondary canals and distributaries have been constructed by the company.

In 1911 this company started the construction of what is known as its Eastern Section. This project is separated from the Western Section at its nearest point by some twenty miles of non-irrigable land.

The lands are fairly well settled and there are already many prosperous farms with substantial buildings and considerable stock. Water is diverted from the Bow river by means of a hollow Ambursan dam 55 feet in height and 720 feet in length flanked by an earth fill 7,200 feet in length at the east end. Altogether five miles of main canal and 2,495 miles of secondary canals and distributaries have been built.



Annual Camp of the Alpine Club of Canada—The Tonquin valley, Jasper National park, showing mount Geikie in the background.

The Canada Land and Irrigation the Canadian Pacific Railway Company controls 532,000 acres of land of which some 200,000 acres may be irrigated when the entire canal system is completed. Construction of the headworks was started in 1909 and completed in 1912. There is a large reservoir in connection with this project known as lake McGregor which is situated forty-four miles from the point of diversion. Works have been constructed and are now in operation for serving 46,000 acres.

The first large co-operative project to be constructed under the provisions of the Irrigation Districts Act of Alberta was what is now called the Lethbridge Northern Irrigation district, by which 105,000 acres lying to the north of the city of Lethbridge are now under irrigation from the Oldman river.

The second district to be organized under the Irrigation Districts Act was the United irrigation district. Works have been completed and are now in operation. Water is diverted from the Belly river by means of a low concrete weir 6½ feet in height and 300 feet long. Ten miles of main canal and 163 miles of secondary canals and distributaries have been built in connection with this district.

A small district comprising 17,000 acres situated thirty miles to the east of Lethbridge has been operated since the fall of 1920. This is known as the Taber irrigation district but is in reality an extension of the Canadian Pacific Railway Company's Lethbridge Section and was financed and constructed by that company under an agreement with the settlers. Water is delivered by the company to the system which is owned and operated by the district.

Another small district known as the Little Bow irrigation district centering around the town of Carmangay has been constructed. Water is diverted from the Highwood river into the Little Bow at the town of High River and will be pumped from that stream by individual farmers for 3,200 acres.

Certain lands lying below the main canal of the Canada Land and Irrigation Company, but not included in that project, have been organized into a district known as the New West irrigation district. Works have been completed and the district is now in operation. There are 4,500 acres in this district.

The Magrath and Raymond districts are now under construction. Like the Taber district these are extensions of

company's Lethbridge Section and are being constructed and financed by that company under an agreement with the settlers. When completed 11,900 acres of new lands will be irrigated in the Magrath, Raymond, and Stirling districts.

Irrigation has widened the extent and increased the variety of the crops grown in southern Alberta. In every district where irrigation is now practised the crops raised include alfalfa, wheat, oats, barley, corn, timothy, rye, potatoes, and sugar beets; and the fact that the average per acre value of all the crops raised in the Lethbridge district during the past five years is placed at \$25.17 indicates the results secured.

## GOLD MEDAL AWARDED TO NEW CANADIAN ROSE

The Agnes rose, originated by the late Dr. Wm. Saunders while Director of Dominion Experimental Farms, has been awarded a gold medal by the American Rose Society. This medal, called the Walter Van Fleet Gold Medal, was presented to the American Rose Society to be awarded for a thoroughly hardy outdoor rose originated on the American continent. Although the American Rose Society received the medal three years ago, it was not awarded until the present year, when it was given to the Experimental Farms in recognition of the merits of the Agnes rose.

The Agnes rose is a cross between Rosa Rugosa as the seed parent and Persian Yellow as the pollen parent. The cross was made by the late Dr. Wm. Saunders at the Central Experimental Farm, Ottawa, Canada, about the year 1900. It bloomed first in 1902 and has been under test at Ottawa ever since and although never protected during the winters, it has never been noticeably injured by the weather. The flowers, double and pale amber in colour, are borne singly and in great profusion. It is fragrant and blooms early but only once in the season. Because of its extreme earliness and great hardiness and the distinct and attractive colour of the flower, this variety should prove a valuable addition to the roses of the Rugosa group.

The number of tourists visiting the National Parks of Canada in 1925 was 250,026, all attracted by the magnificent scenery of these splendid reservations, and the variety of wild animals to be seen therein.

## TABLETS COMMEMORATE IMPORTANT EVENTS

Suitable Memorials Erected on Historic  
Sites at Richmond and in Ottawa

Among the important sites marked by the Department of the Interior on the recommendation of the Historic Sites and Monuments Board of Canada during the past season were two connected with the early history of the city of Ottawa, which last month celebrated the hundredth anniversary of its founding as Bytown in 1826. The one commemorates the death of an early Governor General and the other the turning of the first sod in the construction of the Rideau canal.

On August 17, a cairn, bearing a tablet in memory of the services, self-devotion and tragic death of Charles Lennox, Fourth Duke of Richmond, was unveiled on a spot near the village of Richmond, several miles from the city of Ottawa. The Duke of Richmond was appointed Governor-in-Chief of the Canadas, Lower and Upper, in 1818, and took up his residence in Lower Canada in July of that year. It was during the following year, 1819, while on an official tour of inspection of the Upper province and while visiting the newly surveyed lands allotted to soldier settlers, among which was the settlement of Richmond named in his honour, that his death took place under tragic circumstances. An infected wound of the hand caused by the bite of a pet fox and aggravated by the hot weather and rough journeying caused him so much suffering that his attendants importuned him to rest at Richmond when that settlement had been reached. He made a determined effort to push forward however and after going a short distance was obliged to seek rest in the home of a settler where he died in great agony within a few hours.

The tablet commemorating the hundredth anniversary of the beginning of the Rideau canal, in September, 1826, under the direction of Col. John By, R.E., was unveiled on August 19, 1926. This memorial has been placed on the central pillar on the north side of the bridge spanning the canal in the heart of Ottawa. The construction of the Rideau canal was undertaken with a view to obtaining an interior water route between Montreal and lake Ontario, by way of the Ottawa river, and it has played a leading part in the upbuilding of the city of Ottawa, and in the development of southeastern Ontario.

The motor campsite at the base of mount Rundle, near the town of Banff in Banff National park, Alberta, has been very considerably extended to meet the greatly increased demand by campers. It is now one of the most modern and best equipped in the West.

In 1924 salmon fry of various species were deposited in the waters of Banff National park to the number of 595,221. The restocking of these waters was carried on from the Government hatchery at Banff, Alberta.

Due to the fact that all the Canadian National Parks are game sanctuaries, where no one without permission may carry a gun or kill any animal, or bird, wild life is increasing rapidly and is a source of great enjoyment to tourists.



# NATURAL RESOURCES CANADA

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OTTAWA, SEPTEMBER, 1926

## PROTECTING FORESTS AGAINST DISEASE

Canadian Government Carries on Fight in  
Forest Products Laboratories—Causes  
(Fungous Growths)

The need of protecting Canada's forests is now becoming known throughout the country, especially in the direction of protection against fire. Fire is not the only enemy of our forests, however. There is another enemy, probably quite as destructive but not as spectacular. Fungous diseases take an enormous toll of our timber and timber products each year, and the Forestry Branch of the Department of the Interior is actively engaged in solving the problems which these destructive agencies present.

To the majority of men the growth of punks, conchs or toadstools upon tree, lumber pile, or cellar floor, means little. Their presence, however, is a matter of vital concern to the lumber industry, for it proclaims the maturity of plants which have nourished themselves upon food substance supplied by the wood upon which they appear. They are the symptoms of a most advanced stage of timber disease.

The development of this disease is due to fungous action. Fungi are plants and those with which we are here concerned derive their nourishment from woody tissues. The fungous body consists simply of innumerable branching threads of microscopic size, which ramify through the wood, and absorb and assimilate the foods there found. To permit growth, moisture and air must be present and a moderately high temperature is generally necessary although some growth may occur at low temperature. Having penetrated the wood in all directions the fungous plant is in time sufficiently well nourished to produce its fruits. These are the punks or toadstools, mentioned above, which appear on the wood surface. They indicate a widespread disintegration of the wood upon which they appear, whether it be a forest tree or a roof timber. Then, fulfilling their purpose, these fruit bodies spread abroad a fine, dust-like cloud of spores and disseminate the fungus. Such a cloud may often be noted in moderately still forest air, being gently wafted from the under surface of large woody conchs. Each particle, microscopic in size though it be, carries in it the possibility of further timber infection, for, given favourable conditions for germination, it may in its turn spread destruction through valuable material.

If it be asked how these microscopic spores effect an entrance to forest trees, protected as they are by their heavy covering of bark, the answer is not far to seek. Natural pruning as a tree matures leaves many broken branch stubs, breaks made by passing animals, the fall of neighbouring trees—these and other agents leave many open wounds which furnish acceptable lodging points for these minute bodies. Spores are not the only means of infection possessed by these destructive plants. The branching threads themselves, may in some forms ramify through the soil and infect roots of neighbouring trees. Or the crossing of roots may cause abrasion and, if one is already diseased, may lead to the infection of the other by simple growth of the fungus into the healthy tissues. This passage of the fungus from diseased to healthy material is perhaps the most frequent source of danger in stored lumber. Cases in point are the decking of logs on infected skids and the careless disposition of infected debris in the vicinity of lumber piles.

From the above will be seen the nature of the problems which confront the timber pathologist. Take the case of one timber, jack pine. Jack pine is excellently adapted for railway tie purposes but it is very susceptible to attack by the ring scale fungus. Therefore questions immediately arise such as: How much of this timber is fit for use? What percentage of infection can be permitted without danger? Is the fungus killed by creosote treatment? And to go back further the question comes: How could the original spread of the disease have been prevented? In building timbers, aeroplane wood, mine timbers and in every other of the myriad situations in which wood is used similar questions arise, for in all places where strength and permanence are required fungous growth must be excluded.

Few of the enemies of timber have as yet been studied in such detail that their specific reactions under different conditions can be answered with assurance. From the general habit of growth, detailed above, however, certain general rules may be deduced. Fungi require food, air, moisture and a certain amount of heat. Poison the food supply, exclude air or dry the wood and fungous action is inhibited. Infection is possible only in the presence of spores or of contaminated material. Remove all debris, which may harbour disease, and the danger of infection is lessened.

An estimate of the annual loss of forest trees and structural timbers cannot be made as yet, but from the information available it is known to be of very serious proportions; and these

## AIR PROGRAM BEING CARRIED OUT THIS YEAR

(Continued from page 1)

*North West Territories and Yukon Branch.*—Vertical photography over the Turner Valley oil fields, Alberta.

*Water Power and Reclamation Service.*—Oblique photography in connection with the development of power projects in Ontario and Quebec. Vertical photography in the Lethbridge irrigation district, Alberta.

*International Boundary Commission.*—Vertical photography over the International Boundary from St. Mary river to Waterton lakes, Alberta.

### OTHER DEPARTMENTS

*Department of Indian Affairs.*—Transportation of Treaty Paying parties in northern Manitoba.

*Department of Mines.*—Transportation in the Manitoba area and vertical photography in the Rouyn district (in conjunction with the Topographical Survey).

*Department of Customs and Excise.*—Transportation of officers of the Preventive Service on the British Columbia coast, as necessary.

*Department of Marine and Fisheries.*—Patrols for the prevention of illegal fishing on the B.C. coast.

*Department of Agriculture.*—Flight for the investigation of wheat rust diseases in the Prairie Provinces.

*Department of National Defence—Geological Section.*—Vertical photography in the Rideau Lakes district.

*Department of Public Works.*—Oblique photography of harbour works.

In addition to the work for federal services, similar work is being carried out by provincial governments and commercial interests. The province of Ontario operates its own flying service. During the season of fire hazard, fire detection and suppression patrols are carried on throughout northern Ontario. Forest type mapping is also carried out on a large scale, also transportation of survey parties and the exploration of the district of Patricia. The payment of Treaty Money in the Albany River and James Bay districts, is also conducted under contract for the Dominion Government by the Provincial Air Service.

In Quebec the work is undertaken by commercial companies, under contract, for the Provincial Government.

problems are among the most important upon which the Forest Products Laboratories of the Forest Service are now working.



Aerial Photography in Canada—(Left) View of the town of Bear River, Nova Scotia, showing Digby Gut in the distance. The view is characteristic of this part of picturesque Nova Scotia. (Right) York factory, Manitoba, at the mouth of the Hayes river, Hudson bay. The picture gives a good idea of this famous trading post.—Air Board Photos.

A large program of forest type mapping in the Lake St. John district and the north shore of the gulf of St. Lawrence is being undertaken. Transportation for survey and exploration parties in the same district is carried out on a large scale and photographic mapping in the Gaspé peninsula.

Commercial services are operating air lines into the Red Lake and newly discovered mining areas adjacent, while a regular service is being run from Haileybury into Rouyn, Quebec. In northern Alberta a mining exploration company is carrying out work in the Great Slave Lake area with the aid of a modern flying boat.

## SAFETY AND SERVICE IN LATEST BENCH MARK

In the early days of the Geodetic Survey of Canada experience taught the precise leveller that the best safeguard for the bench-mark (the mark that indicates the altitude above sea level) against vandalism was to make it as inconspicuous as possible. Thus for years the standard bench-mark was a small bronze bolt set vertically or horizontally in such permanent structures as public buildings, etc. However the inconspicuous bench-mark, while it did secure protection against vandals, by its inconspicuousness was in a fair way of defeating the main object of this Survey, namely, service. This is borne out by the experience of the Director of the Geodetic Survey while attending an annual gathering of engineers a few years ago. At one of the meetings he made the acquaintance of a city engineer of one of the foremost cities in Western Canada. In the course of conversation this engineer expressed a desire that the system of precise levels should soon reach his city as he had been desirous for years to place all of his level records on standard datum. To his amazement, he learned that a standard bench-mark was located at the entrance of his city hall and for a number of years every time he entered his office he had passed within a few feet of it.

The Geodetic Survey since that time has adopted a larger and more conspicuous mark which combines both the features of safety and utility.

A portion of the old railway right of way in Jasper National park, Alberta, extending from the town of Jasper to Snaring river, a distance of nine miles, has been converted into a motor highway, and a new bridge built over the river to connect with a proposed extension of the highway.



## MOST NORTHERLY POST AT BACHE PENINSULA

Annual Expedition to Canadian Arctic  
Establishes New Post—"Beothic"  
Returns August 29

The steamer *Beothic* which sailed from North Sydney, Nova Scotia, on July 15 to patrol the Canadian Arctic archipelago and re-provision the posts in the district carried out the operations rapidly, and the wireless apparatus kept the North West Territories and Yukon Branch of the Department of the Interior in touch with her movements at all points in the patrol. After visiting Godhavn, Greenland, and Pond Inlet and Dundas Harbour the *Beothic* on July 30 touched at Craig Harbour, and on August 2 called at Etah, Greenland. The next day she was at Rice Strait, Ellesmere Island and, taking up the supplies left last year at the depot at Fram Havn, reached Bache Peninsula on August 6, where a new post was established. Three days were spent here unloading supplies and assisting the detachment of police in erecting barracks. Bache Peninsula, 79° 04' north latitude and 76° 18' west longitude, is the farthest north police post, customs house, and post office in the world.

On August 9 the *Beothic* started on her homeward journey and reached Dundas Harbour on August 13, and Pangnirtung on August 20. After a good run southward from that post she reached North Sydney on August 29.

## DEVELOPMENT OF ROUYN DISTRICT IS PROGRESSING

(Continued from page 1)

Rouyn village has grown rapidly during the past year. It now boasts some 400 buildings, mostly of log or frame construction. The Royal Bank of Canada, the Canadian Bank of Commerce, and Banque Canadienne Nationale all have branches here; a large and well-constructed public school has been erected; there are now a Roman Catholic and an Anglican church; and a hospital is under construction. Many stores, including hardware stores and drug stores, make it possible to purchase supplies of all kinds on the spot.

The Horne mine is steadily continuing its development. Work during the past few months has been largely concentrated on the 300-foot level and further large tonnages of ore have been proved up. The foundations for the smelter are being laid, using gravel and cement hauled in during the winter. The greater part of the construction must of course await the completion of the railway, and according to the latest reports the first unit can hardly be completed until early in 1928. The first unit as planned will handle 1,000 tons daily, and if desired other units may be added to handle a total of 4,000 tons per day.

On the Waite-Montgomery property drilling has been completed for the present and a large body of copper and zinc ore has been outlined. It is unlikely that mining will commence until the completion of the railway and of the Horne smelter, where the ore will probably be sent for reduction. In the meantime buildings have been erected to house a force of 75 men, and prospecting for further ore-bodies is being vigorously prosecuted by magneto-metric observations.

## INDIAN SCHOOLS IN CANADA\*

### Training Indian Children One of the Important Activities of the Department of Indian Affairs

While the responsibility for the education of Canada's youth rests with the provinces, there is an interesting people that looks to the Dominion Government for the establishment and maintenance of its schools. The training of Indian children is one of the important activities of the Department of Indian Affairs. There are nearly 15,000 In-

the local school board in the upkeep of the school. Average attendance in day and combined schools is about 60 per cent of enrolment and in residential schools 90 per cent.

The residential schools are directly managed by the different churches, and are under constant inspection by the Department. The financial assistance



Indian Schools in Canada—A modern day school typical of those maintained in different parts of Canada by the Department of Indian Affairs. This building which is heated in winter from one central furnace, contains two class rooms, one in each end, and a residence for the teacher in the middle. As in many of these schools a mid-day meal is served to the pupils as part of the domestic science course, the economy and convenience of the arrangement is apparent. This particular school is on a Manitoba reservation.

dian boys and girls enrolled in the 344 Indian schools under the direction of the Department. A three-fold training is the aim—the inculcation of good habits, an elementary academic education, and vocational instruction to fit the graduate for his or her later life.

The schools which the Department supervises and the number of children in each kind of school are as follows:—

	Enrolment
254 day schools .....	8,242
74 residential schools .....	6,327
16 combined schools .....	213
Total .....	14,782

The names "day" and "residential" sufficiently differentiate these two classes of schools. A combined school is one which both Indian and white children attend and is found in districts too sparsely settled to support two schools. The Department of Indian Affairs in such cases co-operates with

On the Amulet claims a shaft is being sunk on a new ore-body discovered during the past winter, and is now at a depth of about 100 feet. Exploratory drilling is also being carried on.

Much interest is taken throughout the district in the development of the Towagamac (Alderson-MacKay) discoveries in Boischatel township. In addition to the three large veins of disseminated ore previously found, drilling during the winter has established the existence of a large lens of almost solid copper sulphide some 50 feet thick. The presence of all these veins was first indicated by dip needle observations. The efficacy of this method of prospecting is becoming increasingly recognized, with the result that magnetic observations are being systematically made on almost all the properties throughout the district.

given by the state is a per capita payment voted by Parliament. This revenue is augmented by contributions from church funds whenever necessary. The following table indicates the number of schools managed by the different churches and also the enrolment in each case:—

	Residential schools	Enrolment
Roman Catholic .....	40	3,514
Church of England .....	20	1,448
Methodist .....	7	794
Presbyterian .....	7	571
Totals .....	74	6,327

(As the figures are for the fiscal year ended March 31, 1926, they are not affected by Church Union.)

Further analysis shows the following number of day and residential schools and pupils in each province:—

Province	Number of Schools		Number of pupils		Total pupils
	Day	Res.	Day	Res.	
P.E.I.....	1	.....	26	.....	26
N.S.....	13	.....	318	.....	318
N.B.....	10	.....	274	.....	274
Que.....	35	.....	1,598	.....	1,598
Ont.....	82	12	2,736	1,024	3,330
Man.....	46	10	1,236	1,024	2,263
Sask.....	25	12	602	1,290	1,892
Alberta.....	4	19	103	1,180	1,283
N.W.T.....	5	3	87	167	254
B.C.....	44	16	1,346	1,506	2,852
Yukon.....	5	2	126	66	192
Totals...	270	74	8,455	6,327	14,782

Indian life is so diversified that one cannot indulge in generalities. Statements concerning Indians in one part of Canada are not applicable to Indians of other sections, therefore, the educational problem is most varied. A course of studies suitable for Indian children on reserves near Brantford and London has few points of contact with the thoughts and needs of the hunting and fishing groups north of the

## GOOD PROGRESS MADE IN MOVING BUFFALO

Shipments of 200 to 250 Animals Leave  
Wainwright Weekly for Wood  
Buffalo Park

As previously announced, the Department of the Interior is sending another shipment of buffalo from the Buffalo National park at Wainwright, Alberta, to the Wood Buffalo park near Fort Smith, Northwest Territories. This is the second movement to be made from the herd of 8,000 at Wainwright, the former having been made last year when 1,634 young animals were shipped approximately 700 miles north to their new home on the Peace river.

The first of this year's shipments was made from Wainwright on June 29 routed by rail to Waterways, Alberta, and thence by scow to a point on the Slave river a little south of Fitzgerald. This landing place is a considerable distance north of the one used last year and was selected owing to the superior facilities offered for the landing of the buffalo.

Since June 29 shipments have gone forward at the rate of 200 to 250 animals per week and will be continued until the whole consignment of approximately 2,000 buffalo has been transferred.

main line of the Canadian National Railways. A school suited to the requirements of the Manitoulin Island Indians is only partly efficient if placed at the Lake of the Woods. Similarly in other provinces, the Department's educational program must be prepared with a view to the particular needs of the various Indian groups.

The comparison is often made and theories advanced, that day schools are more valuable than residential schools for Indian children. It is quite true that in some localities they are very efficient, and excellent results are being obtained. However, the training given at a residential school is of such an all-round nature that the graduate is a better Indian than the day school product. His or her activity has been thoughtfully supervised for twenty-four hours of the day. Ordered habits and respect for the interest of others are acquired. The day school cannot compete with the boarding institute in the organization and supervision of the Indian child's play activities. The churches and the Department are placing more and more emphasis on systematic vocational instruction which, of course, is possible only in residential schools.

\*Prepared under the direction of Dr. Duncan C. Scott, Deputy Superintendent General of Indian Affairs by Mr. Russell T. Ferrier, Superintendent of Indian Education.

Good maps play a very important part in assisting tourists and others to enjoy the beauty and grandeur of the scenery in our national parks. Recognizing this fact the Topographical Survey, Department of the Interior, has recently published for the Canadian National Parks Branch a map of Kootenay park in British Columbia through which the Banff-Windermere automobile road passes. A new edition of Waterton Lakes Park map has also been printed as the first issue had become exhausted.



# NATURAL RESOURCES CANADA

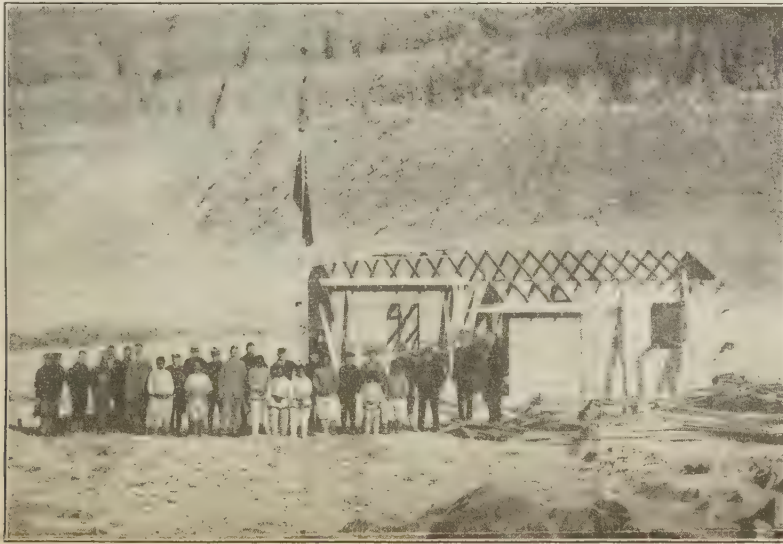
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## SUCCESSFUL PATROL OF THE CANADIAN ARCTIC ARCHIPELAGO



Arctic Expedition of 1926—Raising the Union Jack over the new police post at Bache Peninsula on the east coast of Ellesmere island in 79° 4' north latitude and 76° 18' west longitude. This ceremony marked the official opening of the farthest north police post, customs house, and post office. Mr. George P. Mackenzie, officer in charge of the expedition, is seen at the extreme right of the group.



Arctic Expedition of 1926—The SS. *Beothic*, on which this year's patrol was made, beset by ice in Buchanan bay off cape Rutherford, Ellesmere island. The ship was leaving the new post of Bache Peninsula when she was caught in the ice driven in from Kane Basin. By hard work and the use of explosives the ship was worked through the ice pack into open water in Smith sound.

The 1926 patrol of Canada's Arctic archipelago which was completed with the return of the ss. *Beothic* to North Sydney, Nova Scotia, on August 29, was eminently successful. The patrol duties were carried out; all of the old police posts were visited and supplied; a new post was established at Bache peninsula, on the east coast of Ellesmere island; and the ship returned to port without serious mishap after an absence of only forty-five days.

This year's expedition, which was sent out by the Department of the Interior, through its North West Territories and Yukon Branch, was in charge of Mr. George P. Mackenzie, while the ship's master was Captain E. Falk. Captain L. D. Morin, first officer on the *Arctic*, accompanied the expedition as ice pilot. Dr. L. D. Livingstone was again medical officer; Dr. L. J. Weeks, of the Geological Survey, Department of Mines, geologist; Mr. M. Haycock, assistant geologist; and Mr. W. Q. Ketchum, secretary. Corp. H. P. Friel, of the Royal Canadian Mounted Police went north in charge of the party of constables which was to replace those coming out.

### FEATURES OF THE TRIP

The ss. *Beothic*, a sealing vessel of 2,700 tons, which was chartered for the 1926 expedition, sailed from North Sydney on July 15. On the northward journey, while passing through the strait of Belle Isle and again off the Labrador coast, unprecedented ice conditions were encountered but these did not retard the progress of the ship to any great extent and Godhavn, the Danish Government's

## 1926 Expedition Returns—All Posts Re-provisioned, Personnel Changed, and New Detachment Established at Bache Peninsula

headquarters in North Greenland, was reached in the early morning of July 22. After the usual courtesies had been exchanged and a working schedule for wireless communication in case of necessity, had been arranged, the *Beothic* weighed anchor that afternoon and sailed for Pond Inlet, Baffin island.

To reach Pond Inlet the *Beothic* had to be kept to the west coast of Greenland in order to get around the Melville Bay ice-pack, nearly 125 miles wide, which had begun to move out into Davis strait. While the ship was in the vicinity of the pack a dense fog was encountered making the taking of observations impossible. However by dead reckoning the ship was kept on its course and when the fog cleared the expedition was just off Bylot island. Although the ice had not moved out of the harbour at Pond Inlet it had melted to such an extent that the *Beothic* was able to force her way through and land the supplies on July 26.

Inspector C. E. Wilcox of the Royal Canadian Mounted Police was taken aboard in order that he might carry out his annual inspection of the police posts, and the ship headed for Dundas Harbour, steaming into that post the following day. On the 29th the *Beothic* sailed for Craig Harbour and dropped anchor

there on the 30th. While at this post a wireless message was relayed from Godhavn to the effect that the *Morrissey*, the ship carrying the Putnam expedition and in charge of Capt. Robert Bartlett, had been wrecked on the coast of Greenland about fifty miles south of Etah and that twelve men were ashore without provisions. The expedition therefore sailed immediately. After the *Beothic* had been under way for some time, a second message was received to the effect that the damage to the *Morrissey* was not as great as at first feared and after repairs she had been able to get off under her own power. The *Beothic* then continued her journey northward.

### FARTHEST NORTH POST

The next point of call was Etah, north Greenland and then the dash was made to Fram Havn on Ellesmere island, where the supplies for the new post at Bache peninsula cached last year were picked up. The trip through Rice strait and across Buchanan bay was uneventful and under splendid weather conditions the buildings for the new post were erected near the entrance to Flagler bay in 79° 04' north latitude and 76° 18' west longitude. Before the *Beothic* turned southward on her homeward journey on August 9, the farthest north customs

house, post office, and police post had been officially opened, with appropriate ceremonies presided over by Mr. Mackenzie. Staff Sergt. Joy and Constables Bain and Garnett were left to man the post.

After leaving Bache peninsula, the *Beothic* headed for Buchanan bay where she was confronted with an immense ice-field which was being rapidly driven into the bay by a strong northeast gale. These conditions came as a complete surprise to the members of the expedition after the ideal weather conditions which had prevailed during the eighty hours they were engaged in establishing the new post. It was apparent from the amount of ice in the bay that the wind had been sweeping in the heavy ice from Kane basin ever since the *Beothic* arrived. Faced with the possibility of having to winter in the north, the effort was made to pick a way through the field. Progress was slow and at times the pressure of the ice became so great that the Captain was forced to find safety for the ship behind some grounded ice-bergs. The thickness of the ice was such that the ice cakes grounded in twenty-five feet of water thus leaving a narrow passage along the shore. As a last resort the ship was got into this open water and in this way was worked along to Rice strait. By the use of explosives a passage was forced through the jam in the strait and the ship steamed out into Smith sound, having come through a tight squeeze with only slight damage.

A second call was made at Etah and the ship reached Dundas Harbour on the

(Continued on page 4)



## HOW THE DISTANCES OF STARS ARE DETERMINED

**Dominion Astrophysical Observatory at Victoria B.C., Co-operates With Other Observatories in This Work**

That the stars differ in their *apparent* brightness is self-evident. A thoughtful person might surmise that this is due either to a difference in their light-giving powers or to their being situated at different distances from us. As a matter of fact both are contributory causes and it is only when we know the distance of a particular star that we can have an idea of its real luminosity.

The distances of the nearer stars are determined by a process of triangulation somewhat similar to that which the surveyor uses to obtain the distance of an inaccessible mountain peak. Naturally, the base line must be enormously longer than any used upon the earth and the one that best serves the purpose is the diameter of the earth's orbit about the sun. The small relative shiftings in the positions of the stars as photographed from each end of this 186,000,000-mile base give us data from which to compute their distances.

Through the co-operation of half a dozen observatories in Europe and America the distances of several hundred of the nearer stars had been determined by this triangulation method before the war and this number has been materially increased since. Knowing, then, their distances and their *apparent* brightnesses, their *real* or absolute luminosities are easily computed. It has been found that there is a great disparity amongst them, probably a million-fold being not an extreme ratio. Our own star, the sun, while 100 times brighter than some that are reached by our telescopes, is nevertheless outshone 10,000-fold by others which are designated "giant" stars.

An examination of the spectra or analysed light of these stars of different real luminosities revealed peculiarities by which it was possible to reverse the process and predict the corresponding real brightnesses. That is to say, if we were to secure the spectrum of a star the distance and real brightness of which was unknown we could, from these tell-tale peculiarities, determine the absolute brightness of that particular star. It is then a simple calculation to find out how far away a star of such known brightness must be to appear of the brightness we see it in the sky.

It is in the search for these tell-tale peculiarities in the spectrum that the Dominion Astrophysical Observatory, Department of the Interior, at Victoria, British Columbia, has taken a leading part among the observatories of the world. Many new lines in the spectrum have been found which are specially sensitive in this regard and the added material has greatly improved the accuracy of the method. A list of over 1,100 stars the distances of which have been thus determined has been issued as a publication of the observatory.

The distances cannot be quoted in miles but a popular standard of measurement is the "light-year" which is simply the distance light will travel in a year at its rate of 186,000 miles per second. At this rate light reaches us from the sun in eight and one-third minutes yet the distance of the nearest of the fixed stars is such that light requires four and one-half years to traverse the distance and conse-

## ARCTIC ISLANDS POLICE PATROL

**Thousands of Miles Covered by Royal Canadian Mounted Police During Winter of 1925-26**

Reports received by Commissioner Cortlandt Starnes from the posts of the Royal Canadian Mounted Police on Baffin, Devon, and Ellesmere islands in the northeastern Arctic, show that the winter of 1925-26 was one of great activity, thousands of miles having been travelled in the various patrols made.

Two of these journeys were of special note. One was a patrol made by Staff Sergeant A. H. Joy from Craig Harbour around the southern and western shores of Ellesmere island to Grethasoer Bay fiord and across Eureka sound to Axel Heiberg, the large island lying to the west of Ellesmere; it occupied 40 days and the distance traversed was 975 miles. The other was made by Sergeant J. E. F. Wight from Pangnirtung detachment in Cumberland gulf across the interior of Baffin island to Lake Harbour on the southern coast of the island, accounting for 1,286 miles of travel between February 15 and May 2, 1926.

The first of these was a notable piece of travel, Axel Heiberg hitherto having been one of the most inaccessible of the Arctic islands; Staff Sergeant Joy

quently we say it is  $4\frac{1}{2}$  light-years distant. Another relatively close star is Sirius, the bright star of the winter skies, distant 9 light-years. This investigation places Arcturus and Polaris, stars used a great deal by surveyors, at distances of 41 and 466 light-years respectively, whilst the double star *Beta Cygni*, at the foot of the Northern Cross, is nearly 1,100 light-years distant. Moreover it is found that the stars do not extend to equal distances in all directions; they extend to much greater distances in the direction of the Milky Way than they do at right angles to that plane. The stellar universe is thus not spherical but rather disc-like in form with the long diameter about ten times the shorter.

The main value of such researches is in this determination of the form and structure of the universe—the problem towards the solution of which practically all astronomical investigation tends. When results for the distances of the stars had to be based upon triangulation methods alone we could reach out to a limited distance only. The base line of 186,000,000 miles, enormous as it is relative to earthly standards, is, nevertheless, inadequate for all but the nearer stars and necessity drove astronomers to seek some other method of attacking the problem. The newer method adopted at and enlarged upon at Victoria has the decided advantage that it is usable no matter how infinitely remote the star may be, provided only it is bright enough for its spectrum to be secured. The great light gathering power of modern telescopes makes it possible to secure the spectra of extremely faint stars.

A by-product of the work has been the aid rendered the physicist in his study of the atom. When the astronomer found that certain spectral lines were particularly intense in intrinsically bright stars the physicist was led to seek the reason for the same and the facts marshalled by the astronomer from the high temperature stars have aided materially in elucidating the structure of the atom.

travelled alone, save for an Eskimo dog-driver and hunter. It is expected that the new Mounted Police post at Bache peninsula will prove useful as a base from which patrols can be made of the northern portion of Ellesmere island, of Axel Heiberg and the islands farther west. Staff Sergeant Joy discovered that the western part of Ellesmere island abounds in game.

Sergeant Wight's long patrol took him through a country so little known that the latest maps proved to be inaccurate, as to the situation of several large lakes which it contains. He had to traverse regions unknown to his Eskimo companions.

In addition, numerous other patrols were undertaken. Jones sound was crossed repeatedly, the detachments at Craig Harbour on Ellesmere island and Dundas Harbour on Devon island visiting each other. The Mounted Police now have patrolled the whole of the sea-coast of the southern half of Ellesmere island—the whole of the south coast, the east coast to Kane basin, and the west coast to Grethasoer Bay fiord. They also have patrolled part of the coast of Axel Heiberg; the northern and southern coasts of Devon island; and the whole of the north and east coasts of Baffin island, as well as parts of the south and west coast. The distance travelled by the two detachments on Baffin island was over 6,000 miles, while the Craig Harbour detachment on Ellesmere island had a mileage of 3,300—these figures being exclusive of the ground traversed in hunting trips.

Many dangers were faced by the men in their journeys over ground that in many cases was unknown. Thus Staff Sergeant Joy in descending a glacier to reach the southern coast of Devon island ran into a net-work of deep crevasses masked by light snow, discovering their existence by having his dog teams break through; one trace broke and the dog was not heard of again. When on Axel Heiberg both he and his companion suffered from snow-blindness.

Sergeant Wight's long patrol was for the purpose of investigating the alleged murder of an Eskimo several years ago. During his stay on south coast of Baffin island he visited a number of small bands of Eskimo, finding a good deal of destitution among some of these bands, and relieving their distress.

## TALC AND SOAPSTONE PRODUCTION HIGHER

According to statistics issued by the Dominion Bureau of Statistics, there was an appreciable advance in the production of talc and soapstone in Canada during 1925. Shipments totalled 14,474 tons valued at \$205,835 in 1925 as against 11,332 tons at \$154,480 in 1924.

The Ontario production of talc was obtained from deposits in Hastings county. Practically all of the Quebec shipments consisted of soapstone blocks for use in lining the alkali recovery furnaces of sulphate (kraft) pulp mills. A small tonnage of ground talc was shipped from a deposit at Wolf Creek, Victoria Mining Division, British Columbia.

## AERIAL SURVEYING AS AN AID IN MAPPING

**Application of Aerial Photography to This Work an Important Development of Aviation in Canada**

During the past two seasons planes piloted by the Royal Canadian Air Force have tracked paths back and forth across great stretches of northern Ontario, Manitoba, and Saskatchewan, taking photographs for the making of maps which will be of the greatest value to prospectors, foresters, geologists and others interested in the development of Canada's hidden resources. The areas covered, lying just beyond the fringe of present settlement but within easy access of it, are destined in the near future to play an important part in the progress of the Dominion.

The production of these maps is in the hands of the Topographical Survey, Department of the Interior. It is necessary that the photographs cover the whole area, and accordingly, before each operation a sketch is prepared showing the parallel flight lines required to accomplish this object.

How does the aerial navigator track out these parallel lines of flight across these great and little known expanses? This undertaking properly falls to experienced surveyors, and a Dominion Lands surveyor therefore accompanies each plane as navigational officer.

Of course, he makes use of existing maps but these only show a few of the principal features which, having been plotted largely from explorers' notes, are often misplaced by many miles. The navigator must therefore exercise a nice discretion in their interpretation. Although the magnetic compass is of great assistance too much reliance must not be placed upon it; one must understand its vagaries, its changes in declination over short distances, its response to local attraction, and the influence which magnetic disturbances may have upon it. The force of the wind, often complicated by cross currents, must be reckoned with, its general direction and velocity may vary greatly in a single flight, and drift must always be allowed for in laying off flight courses. At all times the aerial navigator must exercise quick and unflinching judgment for in an hour the plane covers a distance which would require several days travel by canoe.

A most disheartening condition occurs when, in the midst of a flight, clouds intervene below the plane and blot out the landscape. Photographing must then be suspended and the plane piloted back to its base. The navigator is then faced with the task of returning another day and picking up the exact point at which he left off so that the work may be properly carried on.

Such conditions are often met with even though flights are made on those days during the summer when the weather is most suitable for photography. That such operations have been successfully carried out is attested by the fact that it has been possible to make maps of a sufficient order of accuracy for the purpose required, based on aerial photographs, covering a large part of our northern country.

Canada has now ten thousand square miles of the most magnificent territory in the Dominion set apart as national recreation areas. Few countries in the world have made such generous provision for out-door recreation and pleasure.



# NATURAL RESOURCES CANADA

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## EXACT SURVEYS ASSIST CANADIAN DEVELOPMENT

### Geodetic Survey Determines Positions of Control Points in Gatineau Valley

One does not usually associate the stars or the radio with the development of a new country, yet in a recent instance man has made use of them to render assistance in the opening up of a big project in central Canada. One of the first essentials in planning the hydro-electric development now proceeding in the Gatineau valley north of Ottawa, was an accurate map of the district; and the Geodetic Survey of Canada, at the request of the power company and at their expense, undertook the task of ascertaining the positions of an adequate number of the necessary "control" points. Observations on the stars, using radio time signals, gave the necessary information to determine the latitude, longitude, and true north at each point.

In that little known district of the Gatineau are hundreds of lakes and rivers which gather the water which is now to be impounded by gigantic dams, and stored for the big turbines. An intimate topographical knowledge of the district was one of the first requirements of the power company which sent survey parties into the different areas to obtain this necessary information, while the more inaccessible parts were sketched from a hydroplane. In the absence of any co-ordinating survey to combine these different operations, the Geodetic Survey resorted to astronomical observations as a means of definitely locating the points selected, and star observations and radio time-signals thus became essential.

To do this work a party consisting of a geodetic engineer, an assistant, and four guides, equipped with two 17-foot freight canoes, tents, instruments, etc., left Ottawa on July 14 by railway and put their canoes into the water near Clova, a Canadian National railway station about 225 miles directly north of the Dominion capital. From this point the party paddled south over a water route about 40 miles west of the Gatineau river which, after about 200 miles of travel was entered by way of the Gens-de-terre river. From here the party turned north and took observations at a point 30 miles upstream, then returning south, paddled 40 miles to the



Arctic Expedition of 1926—This picture of an Eskimo encampment at Arctic Bay on Baffin island shows the officer in charge of the expedition and Inspector Wilcox of the Royal Canadian Mounted Police investigating conditions.

site of the big Bittobe dam, where observations were again taken.

Continuing from here the party turned west and south leaving the river and portaging to other water routes. They observed, first at the Ignace Depot and finally at the Eagle Depot. This later point is only some twenty-five miles by road from Gracefield on the Gatineau Valley branch of the Canadian Pacific railway, by which line the return to Ottawa was made on September 3.

As the observations were taken with primary accuracy, the instrumental equipment was necessarily heavy, increasing by nearly 600 pounds the weight of the camping outfit and supplies, and necessitating three trips on all portages.

At each of the seven points occupied star observations for local time were made on at least two nights, and the standard time-signals were received by the wireless long wave receiver. A copper bolt was cemented into the rock at each station, and another bolt was placed at a distance due north or south of it to serve as a reference line for future surveys.

### NAME LAKE AFTER HUDSON'S BAY CO. GOVERNOR

Red lake, the scene of mining activity in Patricia district in north-western Ontario, was a centre of fur-trading activity 125 years ago. The great map of Canada made by Aaron Arrowsmith, 1795-1802, from information supplied by the Hudson's Bay Company shows the lake by name with Red Lake House upon it. The present Gullrock lake on Chukuni river bears the name "Prince of Wales" lake. Pakwash lake on the same river is shown "L. Paquash" and Lac Seul as "L. Sal". The latter lake, by the way, is shown on the map of Peter Pond of date 1790, as lake "Alone," the translation of the French "Seul". West of Lac Seul on English river in the position of present Barnston lake is shown "Gov. Weggs" lake, evidently commemorating Samuel Wegg who was Governor of the Hudson's Bay Company from 1782 to 1799. The Geographic Board of Canada has recently approved of the name "Wegg" being applied to the lake adjoining Barnston lake, sometimes called Sandbar lake.

Mount Revelstoke National park, British Columbia, has been connected with the outside world by the opening up of a motor highway from Okanagan valley to Revelstoke, and many motorists have already taken advantage of this new artery of travel.

## CANADA LEADS EMPIRE IN SILVER PRODUCTION\*

High Rate of Output Likely to be Maintained  
—The Provinces Contributing

Canada has held the premier place within the Empire as the greatest producer of silver for the past two decades. During the last few years Canada has been the third largest producing country in the world, being outranked only by Mexico and the United States. Last year (1925) third place was captured by Peru, whose production exceeded that of Canada by slightly over one and a half million ounces.

The principal producing areas in Canada are, in order of their importance, Ontario, British Columbia, and Yukon. Silver ores have also been found in other parts of the Dominion, but the total production from these areas has been small. The total recorded production to the end of 1925 is 493 million fine ounces, last year's output being slightly in excess of 20 million ounces. The market price of silver fluctuates from day to day; the highest yearly averages were recorded on the London market in 1853 and 1854 at \$1.348, and in 1920 at \$1.346. The lowest price was in 1915 at \$0.519. The total market value placed on Canada's production during the years for which records are available (1887 to 1925), based on average market values from year to year was \$318,826,880. In 1925 the production was valued at \$13,815,742.

The mines of Cobalt, South Lorrain, and Gowganda, all in the province of Ontario, are at present Canada's principal silver producers. Ontario's mines have contributed slightly over 363.3 million ounces to the accumulated total of Canada's silver production, of which only 1.8 million ounces were produced prior to 1903, the year of the discovery of the Cobalt area. The average production in Ontario for each of the past four years was 10.7 million ounces. Dividends paid out to the end of 1925 by silver companies operating in northern Ontario amounted to approximately \$92,000,000.

Silver production in British Columbia and in Yukon is obtained from lead-zinc ores. The present rate of production in British Columbia is about 8,500,000 ounces per annum; Yukon production last year was about 905,000

\* Prepared under the direction of Dr. Charles Cammell, Deputy Minister, Department of Mines, by A. W. G. Wilson, Ph.D., Mines Branch, Ottawa.

## FINAL REPORT OF PEAT COMMITTEE

Fuel Can Be Prepared by Air-Drying—  
Many Large Bogs Favourably  
Situated

The prospect of the establishment of a peat fuel industry in Canada has been materially advanced by the investigations carried on by the Peat Committee, according to the final report of that body, published by the Department of Mines. The Peat Committee was appointed jointly by the Governments of the Dominion of Canada and the province of Ontario, with the object of finding, if possible, a practical-working and commercially-feasible method of making available the products of our extensive peat deposits as an auxiliary source of fuel supply, especially in the "Acute Fuel Area" of Ontario and Quebec. The foreword to the committee's final report states that a gratifying measure of success had been met by the committee in its investigations and that the object of its appointment had been substantially attained.

The unsatisfactory situations which have arisen in parts of Canada, particularly in Ontario and Quebec, through the dependence on anthracite of foreign origin brought forward the necessity for a domestic source of fuel supply for this area. An investigation into the possibilities of peat as a substitute fuel was undertaken and the committee began its investigations in 1918. Field operations were carried on by the committee at the peat bog near Alfred, Ontario, about 40 miles east of Ottawa. During the period of investigation machines were designed and methods developed by which the production of peat on a commercial basis could be accomplished. The investigators went further and made a study of the uses to which peat fuel could be put and how the bogs not worked for fuel and those from which the peat had been removed could be utilized for agricultural purposes or otherwise advantageously disposed of.

The outstanding conclusions arrived at by the committee were that the only methods or processes which could be economically employed for the manufacture of peat fuel were those employing air-drying, that the climatic conditions in Ontario and Quebec were favourable for the manufacture of peat fuel for 100 days during the summer season, and that the commercial production of this form of fuel, on a large scale, could be conducted on many of the bogs which had been examined in detail, and which were favourably situated with regard to centres of population and transportation facilities.

There appears to be every reason to believe that the present rate of production of silver in Canada will be maintained for some years to come. The decline in production in Cobalt has been more than compensated by new discoveries and increased production from South Lorrain and Gowganda, and there has also been an increase in the production from British Columbia.

Canada's production of cobalt totalled 1,116,492 pounds valued at \$2,328,517 during 1925 as against 948,704 pounds valued at \$1,682,395 in 1924, according to the Dominion Bureau of Statistics.



## LEADING POSITION OF CANADA'S FISHERIES

Value of Output Has Remained Steady—  
Many Kinds Are Native to  
Canadian Waters

Canada's fisheries, carried on in the waters of two oceans, the Atlantic and the Pacific, and upon a system of great lakes and inland waters, stand in both quantity and value among the leading fisheries of the world. The value of the output in 1925 reached a total of \$47,926,802, an increase of \$3,392,567 over 1924, according to statistics compiled by the Dominion Bureau of Statistics in co-operation with the Department of Marine and Fisheries.

The importance of the industry may be also gauged by the statement that the capital invested in equipment and establishments in 1925 was \$46,411,647, an increase of \$2,554,297 over the previous year, and that the number of employees engaged in the industry last year was 73,855 of which 58,291 were employed in primary operations.

The value of the fisheries of Canada, by provinces, in 1925 was as follows:—

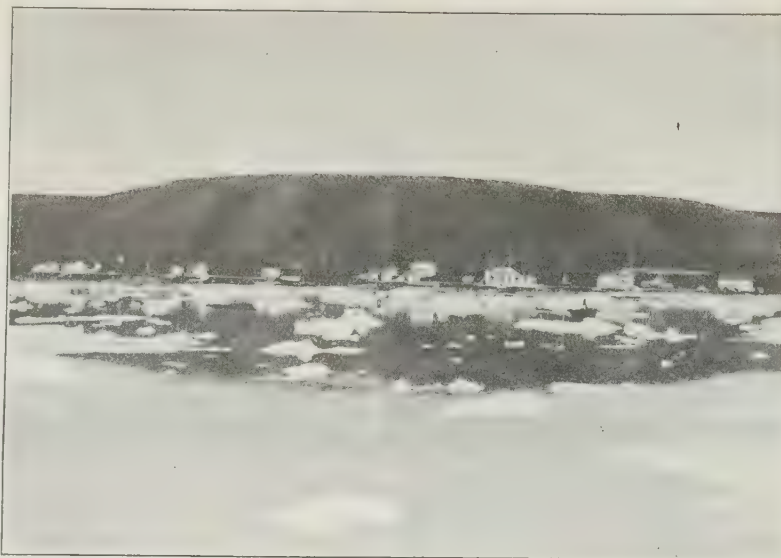
Province	1925
Prince Edward Island . . .	\$ 1,598,119
Nova Scotia . . . . .	10,213,687
New Brunswick . . . . .	4,798,589
Quebec . . . . .	3,044,919
Ontario . . . . .	3,436,412
Manitoba . . . . .	1,466,939
Saskatchewan . . . . .	479,645
Alberta . . . . .	458,504
British Columbia . . . . .	22,414,618
Yukon Territory . . . . .	15,370
Total . . . . .	\$47,926,802

The record of value of fish production in Canada for the past five years indicates a gradual improvement since 1921. The figures for the five years are:—

1921 . . . . .	\$34,931,935
1922 . . . . .	41,800,210
1923 . . . . .	42,565,545
1924 . . . . .	44,534,235
1925 . . . . .	47,926,802

As will be seen the value for 1925 was the largest recorded in the past five years. The principal kinds of fish taken in that year, in order of value, were: salmon, \$15,760,630; cod, \$6,232,821; lobsters, \$5,552,977; halibut, \$4,185,391; herring, \$3,117,841; whitefish, \$1,974,871; and haddock, \$1,171,555.

Since the earliest days of North American history the coastal and inland waters of the Dominion have been great producers of fish and so they still remain. It is stated by experts that there are over 600 different kinds of fish native to Canadian waters and that few of these are not of value as food. As yet only about fifty species are being utilized and only about fifteen are in demand on the Dominion's markets. In the deep-sea Atlantic areas, there are such staple fish as cod, haddock, halibut, hake, herring, mackerel, lobsters, smelt, salmon, shad, oysters and clams. The Great Lakes area, and lake Winnipeg and other prairie waters, produce the following well-known varieties, whitefish, lake herring or lesser whitefish, lake trout, dore or yellow or blue pickerel, black bass, sturgeon, and catfish. The waters of the great plains east of the Rocky mountains and of the Hudson Bay area, yield large whitefish, dore, jackfish, gold-eyes, the salmon-like inconnu of the Mackenzie basin, Arctic herring, and grayling. Waters west of the Rockies, the Pacific area of British Columbia, and the Yukon Territory contain an abundance of excellent fish such



Arctic Expedition of 1926—View of Pond Inlet, on the northern coast of Baffin island showing on the left the buildings occupied by the Royal Canadian Mounted Police detachment. These include the barracks, store room, and blubber house. The buildings of the Hudson's Bay Company may be seen at the right and include the residence of the officer in charge, the company's store, and the blubber house. The native village which is not shown in this picture is along the beach at the right.

## SUCCESSFUL PATROLS OF THE CANADIAN ARCTIC ARCHIPELAGO

(Continued from page 1)

13th. The native settlements at Arctic Bay and Admiralty Inlet, on the northern coast of Baffin island, the police post at Pond Inlet, and the Clyde River trading post were visited, and the *Beothic* reached Pangnirtung on August 20. Dr. Weeks, the geologist, Mr. Haycock, his assistant, and Dr. Livingstone, the medical officer, remained at Pangnirtung, and with this post as a base will carry on their respective investigations during the coming year. Inspector Wilcox, of the Royal Canadian Mounted Police, who has been in charge of work in the archipelago since 1924, returned south with the ship on his way to headquarters at Ottawa.

### SATISFACTORY WORK PERFORMED

The *Beothic* sailed on the final leg of the return journey on the following day. While off the coast of Labrador stormy weather was encountered. The seas ran so high that two of the ship's boats were swept overboard, and Mr. Ketchum, secretary to Mr. Mackenzie was thrown across the cabin and suffered the fracture of four ribs. The ship came through without further damages or accidents and reached North Sydney safely on August 29.

as salmon, halibut, herring, pilchards, rock cod, black cod, and many varieties of flat fish.

Of the game fish in Canada much has been said. The salmon rivers of the lower St. Lawrence and the Atlantic coast from the gulf to the coast of the state of Maine, are world famous. In Ontario's waters speckled trout abound everywhere and black bass afford the highest class of sport. On the Pacific coast there are also such famous sport fish as the king salmon, or quinnat, the steelhead, red-throat and rainbow trout, while in the little known waters of the north near the Arctic circle, excellent grayling of two species abound. Whaling, fur-seal, and hair-seal hunting, and other marine industries furnish fields for remarkable enterprise.

Canada's fisheries are independent of drought or storm. They are self-seeded, self-cultivated, and self-matured, and with proper conservation and utilization they will remain a permanent source of wealth to the nation.

Very satisfactory service was rendered by the *Beothic* and its officers and crew. The rapidity with which the posts were reached and the supplies and personnel landed aided greatly in the accomplishment of certain duties which delays would have rendered difficult. The completion of the entire patrol in about six weeks, and the maintenance of daily wireless communication were also outstanding features. In connection with the latter, credit is given Mr. E. J. Meade, of the Engineering Staff of the Canadian Marconi Company, who was in charge of the wireless apparatus. The excellence of the service was largely responsible for the good results obtained.

Eminently satisfactory work has been accomplished by the Royal Canadian Mounted Police stationed at the posts in the Canadian Arctic archipelago during the year. Patrols were made by both officers and men on Baffin, Ellesmere, Devon, Axel Heiberg, and other of the islands in the archipelago. Similar work will be carried on during the coming winter.

The results of the expedition in general fulfilled expectations. At several stages heavy ice conditions were encountered but in every case the obstacles were overcome and the objectives reached. After three previous attempts, the establishment of a post on the east coast of Ellesmere island was effected. Wireless communication, which in other years had been possible only at intervals, was maintained daily during the entire trip. Conditions among both whites and natives were found to be generally satisfactory. The work of supplying the posts and changing the personnel was completed and all arrangements made for the satisfactory carrying out of the various activities of the officers remaining in the North.

The extraordinary activity in the Red Lake district and adjoining areas emphasizes the value of accurate maps as an aid in travelling through new country and in prospecting. The Topographical Survey, Department of the Interior, has published several maps of this area, from information obtained from aerial photographs based on ground control surveys. The Lac Seul, Pointe du Bois, and Carroll Lake sheets on a scale of one inch to four miles and the Red Lake sheet on a scale of one inch to two miles cover a large part of the area in which prospecting is now being done.

## GEOLOGICAL WORK ON BAFFIN ISLAND\*

Department of Mines Official Investigating Mineral Possibilities of Largest of Arctic Islands

Baffin island which lies immediately to the north of Hudson strait is at present a field of investigation by the Geological Survey of Canada. Dr. L. J. Weeks and an assistant were landed during the summer on this island from the Canadian Government boat making the annual trip to the established posts in the Arctic. They will remain during the winter and carry on a geological survey of the southern part of the island.

Baffin island is the largest and probably the most important of the Arctic islands. It has an area of 211,000 square miles. Observations made along the part of the coast that has been explored show that it is underlain by rocks of Precambrian and Palaeozoic age and to less extent probably by Tertiary sediments. A small tonnage of graphite and mica has been shipped from the southern part of the island, and at Pond Inlet in the northern part a small quantity of coal is mined.

The coal, according to Dr. Weeks who visited the place in 1924, is well exposed in a cliff on Salmon river, and is regarded as of Tertiary age. Two main seams each 3½ feet thick and 16 feet apart are found. It is the coal from the lower seam that is being utilized by the Hudson's Bay Company. When freshly dug it breaks into irregular lumps which are dull black with here and there a bright surface, and which show nothing resembling a cleavage plane. After being sacked and left some months in the open it shows a tendency to crumble. The crumbling is not so great as in the coal from the upper seam. An air-dried sample gave on analysis: moisture, 14.2 per cent; ash, 5.0 per cent; volatile, 23.4 per cent; fixed carbon, 57.4 per cent; calorific value, 10,300 British thermal units.

A second exposure occurs at a point, a mile downstream on the Salmon river from that referred to above, from which quantities of coal have been obtained.

\*Prepared under the direction of Dr. Charles Camsell, Deputy Minister, Department of Mines, by Mr. Wyatt Malcolm, Geological Survey.

In 1925 the production of salt in Canada exceeded all previous records according to final figures issued by the Dominion Bureau of Statistics. Shipments during the year totalled 233,746 tons as compared with 207,979 tons produced in 1924. The production in Ontario amounted to 226,315 tons or 97 per cent of the total; Nova Scotia and Alberta contributed the remainder. The year's shipment of 833 tons from Alberta came from the Fort McMurray district, where development work in the salt industry has been carried on for a considerable time. Nova Scotia's production consisted of salt mined at Malagaash.

A new townsite has been laid out in a beautiful situation near Lake Louise in Banff National park, Alberta, and is being rapidly developed. Lots are being taken, and houses, tea-rooms, stores, garages, and stables erected. Motorists and other tourists are availing themselves of the facilities afforded.



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## IMPORTANCE OF GYPSUM MINING IN MARITIMES\*

### SECOND ONLY TO COAL INDUSTRY

#### Products of Deposits in Nova Scotia and New Brunswick of High Quality

Gypsum is second only to coal as the most important mineral produced in the provinces of Nova Scotia and New Brunswick, where it has been mined for more than a century.

In New Brunswick the chief production has come from the occurrences at Hillsboro in Albert county. These deposits contain an exceptionally pure quality of gypsum, and the Hillsboro products, for this reason, are in high favour with the building trades not only in Canada but also in the United States. The gypsum mined here is manufactured into hard wall plaster, finishing plaster, and dental plasters of different grades. These products are largely sold in Canada but a certain quantity also goes to United States purchasers and a good market has been developed with Australia and New Zealand. Only about one-fourth of the gypsum quarried is exported in the crude form. Occasional shipments of anhydrite, a mineral closely allied to gypsum, are also made to the southern United States for use as a fertilizer. Many other occurrences of gypsum in New Brunswick are known, but the Hillsboro deposits remain the greatest producers.

In Nova Scotia occurrences of gypsum are widespread and are the largest of any at present known in Canada, contributing seventy-five per cent of the total Canadian production. Nine million tons of gypsum have been quarried in this province since 1872, the greater part of which has been shipped mainly in the crude form to the United States. Production for the province in 1925 reached a new high level of 471,174 tons, and statistics now available for the first six months of 1926 indicate that this high output will be maintained. Wall plaster made from the Nova Scotia product has a finer texture, smoother working qualities, and more uniform "set" than that made from the gypsum generally produced in the United States and is in great demand in that country for these reasons. The chief producing area is at Windsor, Hants county, where five or six companies are operating. The Wentworth and Walton deposits are the

## WINTER SPORTS IN CANADA

*How many of our summer visitors know the  
thrill of a Canadian winter?*

*To those who delight in bracing air and the  
pleasure of winter sports, to those in search of  
new and unexpected scenes of winter beauty, Canada  
extends a hospitable welcome.*

*Chas Stewart*

Minister of the Interior.



Winter Sports in Canada—There are hundreds, even thousands of skating rinks scattered over Canada where young and old daily disport themselves on the ice—Group of skaters photographed on an open air rink in one of our cities.

Canada has always been noted for its winter sports. From the earliest times skating, tobogganing, and snowshoeing have had their devotees and with the increase in the urban population and the greater need for outdoor exercise to offset the strain of the close application to indoor pursuits these forms of sport have been supplemented by ski-ing, curling, ice-boating and hockey. These sports provide such a wide range that both sexes from childhood to old age can take part in at least one of them with zest and benefit. Hockey is the most strenuous of games; curling is akin to golf in its appeal and its physical demands; whereas skating, snowshoeing, ski-ing and tobogganing can be as strenuous or as leisurely as the participant desires. Ice-boating demands rather unusual facilities in the way of great expanses of smooth, snow-free ice,

but, where conditions are favourable, it provides thrills comparable only to those of flying. All these sports develop skill, ease, and grace, and all promote a strength of body and a love of the outdoors that are assets throughout life.

Physicians are now agreed that the avocation, hobby, or sport should be so different from the vocation as to provide a complete and pleasurable change for both mind and body, and this Canada's winter sports do for the average man. It is for this reason that, in addition to the thousands who take part for the joy of the sport, thousands more come in on the advice of their physicians, and it is no mere figure of speech to say that both these classes find the winter all too short to accomplish what they desire to do.

(Continued on page 4)

## BUFFALO GIVEN NEW LEASE OF LIFE IN CANADA

### SUCCESS OF EXPERIMENT AT WAINWRIGHT

#### Rapid Increase of Herd Necessitates Finding of New Outlets for Surplus

Canadians in every province cannot help but feel a thrill of pride when they learn that the great herd of buffalo, at Buffalo National park, has been increasing so rapidly that, although four thousand head have in the past two years been shipped to augment the wild herd in the Northwest Territories there is still such a surplus over the capacity of Buffalo park that arrangements are being made to dispose of two thousand more. This simple statement means that the great experiment undertaken by Canada in 1907 has proved a success beyond the highest expectation of its advocates; it means that the niche prepared by historians for the buffalo alongside the dodo and other extinct species will not be required; it means that one of the largest and most magnificent mammals on the earth has been given a new lease of life; and, on the practical side, it means that this animal, which played such a large part in the days of the opening up of our middle west, has been brought back to assist Canadians in solving problems connected with the development of the far North.

The "return" of the buffalo means very much to citizens in all parts of Canada, as those whose recollection or reading goes back to the eighties of last century will at once realize. Forty years ago the family buffalo robes were as much an institution in well regulated Canadian households as the heating stoves. These robes were in constant use. One constituted a thick, warm rug for the small children to play on before the fire, another was always used as a laprobe when the family went driving in winter, while the best one made a fine splash of dark and regal colour when displayed as a drape over the back of the sleigh. And, then, even in the coldest weather and most distant spare bedroom, no unexpected guest could be cold if a robe were used as a coverlet. For those who had to do much driving a "buffalo" overcoat was a necessity.

This was the normal course of affairs until the middle eighties when the Canadian householder awoke to the fact that there were no more buffalo robes. They did not grow dearer by slow degrees. They simply disappeared from

(Continued on page 2)

\* Prepared from information supplied by the Department of Mines, Ottawa, Canada.



## FOREST RESERVES —THEIR PURPOSE

Setting Aside of These Areas Enables Government to Carry Out Principles of Forestry Without Interruption

There are some popular misconceptions in the public mind as to the object of the creation of Dominion Forest Reserves. The term "reserve" is perhaps responsible in some degree for these misconceptions on the part of many who do not have occasion to inform themselves on the intention of Parliament in setting aside these areas. For instance, a common impression is that these areas consist almost entirely of mature stands of valuable timber which have been withdrawn from disposal and are being held to supply a demand when timber from other sources will have been used up. Those who hold this view usually conceive of a forest reserve as being rigidly closed to the public, and think that no business or recreational pursuits of any kind may be carried on within its boundaries. Nowadays the term "forest reserve" is being replaced by the term "national forest," an expression which more truly reflects the fact that these areas are dedicated by Parliament to productive use for the benefit of the people of Canada.

The following are the chief factors governing the setting aside of Government lands as forest reserves:—

- (1) To secure the protection, maintenance, and reproduction under scientific management of the timber growing on the land.
- (2) To devote to the growing of timber, lands which are primarily suited to that purpose and which are not suited to agriculture.
- (3) To conserve the water supply of a watershed and prevent the rapid runoff, thus ensuring the continuity of stream flow.

It will thus be seen that a forest reserve may contain areas of mature timber, areas of young forest growth, and sparsely wooded or even treeless areas.

The mature stands of timber are submitted to a careful examination, and the quantity determined which can be removed without impairing the timber reproduction of the area. The trees to be removed are marked and the logging rights on the area are disposed of by public competition, as the demand arises.

The areas of young growth are studied and the rate of growth hastened by thinning and the removal of undesirable species.

In the sparsely wooded districts, if a sufficient number of seed trees are present, the area will gradually revert to forest by natural reproduction. In districts where an insufficient number of seed trees of desirable species are present, artificial planting or seeding will have to be resorted to, in order that a satisfactory tree crop may result.

The more lightly wooded districts usually produce an abundant growth of forage plants. Where a demand exists, the residents of lands in the vicinity of the reserves are allowed to pasture stock on these areas under certain regulations. The stock-owners are thus helped by the grazing facilities offered, and at the same time, the reserve is benefited by the removal of the forage growth which when dry constitutes a serious fire menace.



Buffalo Given New Lease of Life in Canada—With the rapid increase in the number of buffalo in Canada, buffalo pelts are again beginning to find a place in Canada's domestic economy. The above picture shows the buffalo skin rugs which carpet the floor of the library of the Speaker of the House of Commons in the Parliament Buildings at Ottawa.

## BUFFALO GIVEN NEW LEASE OF LIFE IN CANADA

(Continued from page 1)

the market and could not be had at any price. Buffalo robes remained out of Canadian life until two years ago when a comparatively few specimens were available, because of the killing of the surplus animals in the Buffalo park in the autumn of 1924.

Success has, of course, brought responsibilities. If the last buffalo were now dead and its skin mounted and neatly labelled in the Victoria Memorial Museum in Ottawa, certain Government officials would have been spared many of their anxious hours of the past ten years. For the Canadian buffalo did not remain an anaemic, spiritless "representative of a vanished race." He came back with a bang! A fence that would hold the most husky prairie steer was nothing to a gay young buffalo; and the herd grew so fast that the generous "park" of nearly 200,000 acres (roughly about thirteen miles square) became some years ago too small. Since that time the selection of the best methods of disposing of the annual surplus of about two thousand animals has been one of the immediate problems of the Department of the Interior. Two thousand buffalo were slaughtered in 1924, nearly four thousand more, as already stated, were sent north in 1925 and 1926 to the big Wood Buffalo park near Fort Smith, Northwest Territories, and now, at the proper

It will be seen, therefore, that the main reason for the creation of forest reserves is to enable the principles of forestry to be carried out on these areas without interruption, over a long period of years. In other words, these areas may be looked upon as large tree farms which are to be managed in such a way that they may be made to produce an undiminished supply of timber, the output each year being governed by the annual increment in growth; or to use another comparison, the timber on the forest reserves may be considered as forest capital, and the cutting permitted each year as the interest obtained, the capital itself remaining unimpaired.

season, two thousand more are to be slaughtered under the most modern and humane conditions, and buffalo meat, heads, and robes will, to a limited extent, be again available.

The problems are many and varied. There are experiments in domestication, in cross-breeding with domestic cattle and yak, and in dressing the hides. Progress is being made in all these and very definite success has attended the last-mentioned investigation. The old methods of tanning turned out a good robe but one a little too heavy and stiff for making up into overcoats, except for driving. The newer processes produce a pelt soft and pliable, and so much lighter than the old that men's overcoats now weigh from eight pounds up, according to the trimming. Buffalo robes have always been noted for their wearing qualities but these from Wainwright are superior to those of old times, because the animals are not killed in summer but in early autumn, when the hide is in the best possible condition and the new hair is dark and glossy and firmly anchored. In autumn also the animal is in prime condition as regards meat. The disposal of a portion of the herd in 1924 gave Canadians a new idea of buffalo meat, which they had supposed was used chiefly for making pemmican, and when citizens discovered that it was as nutritious and well flavoured as the finest beef, and had moreover an alluring wild tang the taste for it rapidly developed.

Of the heads only a proportion are fine enough for mounting but these are selected and carefully handled so as to give the best results. It is, perhaps, worthy of note that of the heads and robes that the previous disposal made possible a large proportion were picked up by residents of other countries. The British Isles were well represented, so was every part of the United States, and France, and even Argentina secured some of the trophies.

It is as yet impossible to prophesy the full development of the buffalo under modern conditions but enough has been accomplished to show that the one time "lord of the plains" has returned to become once more an important factor in Canadian life.

## HUNTING IN CANADA GAINS IN POPULARITY

Increasing Numbers of Hunters Enter Forests Each Fall in Quest of Big Game

Canada is one of the most fortunate countries in regard to resources in big game. Practically every province is well stocked with wild life and as a result the numbers of big game hunters both from within the Dominion and from abroad who enter our forests each year are rapidly increasing. The hunting period in all the provinces is in the fall and the average season is of about two months duration, closing, with a few exceptions, in November or December. Reports from different parts of Canada indicate that big game is exceptionally plentiful this season and in consequence the influx of hunters is large.

The presence of big game in close proximity to the centres of population occurs in nearly all of the provinces in Eastern Canada. In Nova Scotia and New Brunswick there is presented to the hunter a choice of territory which is easily accessible. However it is to the more remote districts, which are usually reached by wagon road, trail or canoe route, that the big game sportsman must turn for moose, deer, bear, and wildcat. The provinces of Ontario and Quebec include within their boundaries some of the finest hunting territory in America. Although in some districts in Quebec the hunting rights on certain tracts of land are leased to organized hunting clubs, there is still much public land where excellent hunting may be had. Moose and deer may be found in abundance and there is good caribou, bear, and wolf hunting. In Ontario there is such a large number of excellent hunting districts which are readily accessible that the hunter in making a choice needs only to be governed by the distance he wishes to travel and the kinds of game he prefers to hunt. Deer may be had in forested areas close to settled districts in southern Ontario, and there is in addition the famous big game region in the vast territory lying north and west of the French river.

The forested areas of the provinces of Manitoba, Saskatchewan and Alberta are likewise visited by increasing numbers of hunters. Small game abounds in the open sections of these three provinces. In the more wooded and northern sections there is an abundance of large game such as moose, deer, and caribou, and bear and wolf are also met with. Buffalo, elk, and antelope are rigidly protected.

The mountain areas of Alberta and of the province of British Columbia present a striking contrast to the other sections of the Dominion both in kinds of game animals available and the methods of hunting. Besides the mountain goat, mountain sheep, cougar and grizzly; moose, caribou, deer and bear are found. The usual method of hunting involves the use of a pack train.

The wisdom and foresight of the Governments, both Federal and Provincial, in enacting suitable game laws and in strictly enforcing them enables Canada to provide a means of healthful recreation for all Canadians and an inducement to foreign sportsmen to visit the Dominion and share in this wonderful heritage.



# NATURAL RESOURCES CANADA

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## STUDYING CONDITIONS IN NORTHERN CANADA

### Investigators Return from Arctic Coast —Situation of Natives and Their Food Supply

Every year sees an advance in the development of Canada's northland, and brings into greater prominence the importance of having in that region a vigorous native population. Canada's duty and interest coincide in this regard, for if advancing civilization were to deprive the natives of their old means of livelihood, the Government as their guardian would be expected to provide them with means of subsistence, and on the other hand, no permanent advance can be made without a progressive and happy population.

The northern Indians are inhabitants of Canada's Great Northern Plain, sometimes erroneously called the "Barren Grounds," and the Eskimos dwell on the Arctic coast and the archipelago. Both Indians and Eskimos are dependent for their living upon the wild life of the country. With the advance of trade and civilization into the north there have been changes which have disturbed the old balance and have made a greater drain upon some forms of wild life, both land and marine, than upon others. The possession of high-powered rifles and the use of some items of the white man's food and clothing are bringing about in native modes of life far-reaching changes, with their attendant dangers to the health and self-reliance of the people. The animal first affected by changed conditions was the musk-ox and the hunting and killing of this animal is now prohibited throughout all the north. The caribou has become considerably reduced in numbers and, what is of almost equal importance to the natives, the caribou migration routes have been so changed as to cause them to be entirely absent from large districts where, in season, they were formerly plentiful.

For the purpose of studying these problems the Department of the Interior, through the North West Territories and Yukon Branch, has had several experienced officers travelling in the north and living among the natives. Two of these explorers have just re-



Canada's Musk-ox and Caribou—Herd of caribou swimming the Yukon river in Yukon territory. The photograph was taken during the past summer from the deck of a steamer shortly after it had left Dawson for White Horse.

Photo by courtesy of White Pass & Yukon Route.

turned to Ottawa: Mr. W. H. B. Hoare, who left for the north in June, 1924, and Major L. T. Burwash, who went out in July 1925. Both have had many years experience in the north, both speak the Eskimo language, and live and travel in native fashion, with one or two native helpers. It is because of this familiarity with native life and habits of thought that these officers have been able to impress upon the Eskimos the great benefit to themselves and to their children of the whole-hearted carrying out of the principles of wild life conservation as embodied in the Northwest Game Act and departmental regulations.

Mr. Hoare investigated conditions in the region between Coronation gulf on the north and Great Slave lake on the south; and from Bathurst inlet on the east to Great Bear lake on the west. —a district about four hundred miles square. He spent the first winter in traversing this area from east to west, and the second winter in travelling it from north to south, and then back northward to the Arctic coast. In his second winter he discovered the route of the main migration of the caribou. Formerly they wintered east of Great Slave lake and spent the summer on Victoria island and other islands of the Arctic archipelago; now they turn eastward before reaching the coast, and summer in the country west of Back river. This, of course, greatly affects the living of the natives on the coast, who formerly were accustomed to shoot a certain number of the caribou as they crossed over to the islands.

Major Burwash established his winter quarters in a hut on King William island and from this base made trips in different directions by dog sled. The natives in this district he found healthy and vigorous but the caribou here acted in a similar manner to those farther west. Formerly the herds in this area ranged from Kasba lake near the north boundary of Manitoba to King William island and other islands in the neighbourhood; today they do not leave the mainland but spend the summer on Adelaide peninsula. In the spring of 1926 Major Burwash sledged across to Repulse bay, one of the indentations of the northern end of Hudson bay, and thence travelled to Chesterfield inlet by open boat. During the latter part of his journey and in his subsequent trip on Hudson bay by steamer he gave special attention to sea-life, especially seal, walrus and whale.

These investigators present on the whole a hopeful view of the situation and they will make certain recommendations as to changes in regulations which, it is hoped, will benefit the native

population and prevent further depletion of the wild life of the country.

In connection with this investigation one very encouraging sign as regards the caribou is that, whereas they disappeared from the northern part of Yukon when hunting to supply whaling ships with fresh meat was at its height thirty years ago, they have now come back—to the great benefit of all the inhabitants. The numbers in which the caribou have returned are indicated in a report made by Superintendent Telford, stationed at Dawson, to Commissioner Starnes, of the Royal Canadian Mounted Police, an extract from which has been received by Mr. O. S. Finnie, Director of the North West Territories and Yukon Branch. The report states that while the Superintendent was on an inspection trip by steamer on the Yukon river this year, so many caribou were encountered swimming across the river that it was necessary to steer very carefully and on several occasions to stop the steamer in order to avoid striking the animals.

### TOTAL POWER IN USE IN CANADA

The total horse-power installed in Canada for all uses except steam railways at the end of 1925 is estimated thus:—

	Horse Power	% of Total
Water-power. . . . .	4,282,000	80
Fuel power. . . . .	1,068,000	20
	5,350,000	100

This is equivalent to fifty-seven one-hundredths of a horse-power per capita, a figure which is only slightly exceeded by that for the United States.



Importance of Gypsum Mining in Maritimes—Loading gypsum rock into cars on a light railway for transportation to the mill at a gypsum plant in the Maritime Provinces. Gypsum is taken out both by open quarrying and by underground mining.

## SUCCESSFUL MEETING ORNITHOLOGISTS UNION

### Bird Lovers From United States, Australia, and Canada Meet in Ottawa— Officers Elected

Representative bird-lovers from the United States, Australia, and Canada to the number of 140 gathered in Ottawa for the meeting of the American Ornithologists Union in the Victoria Memorial Museum during the four days October 11 to 14. The opening day was devoted to the business of the Union and the election of officers.

Dr. Alex. Wetmore, Assistant Secretary of the Smithsonian Institute, Washington, District of Columbia, was elected president for the ensuing year. The other principal officers of the Union are: vice-presidents, Dr. Joseph Grinnell, Berkeley, California, and Mr. James H. Fleming, Toronto, Ontario; secretary, Mr. T. S. Palmer, Washington; treasurer, Mr. W. L. McAtee, Washington.

The next three days were taken up with papers on different phases of bird protection and one of the most important resolutions passed deprecated any general campaign against hawks or owls and protested the use of the word "vermin" in reference to these two species.

Luncheon was served to the members during the meetings at the Museum and through the courtesy of the Department of the Interior buffalo meat was included in the menu. This treat, which was supplied from the great herd in Buffalo National park at Wainwright, Alberta, was greatly enjoyed by the delegates.

Official field excursions were conducted after the business of the meeting was finished, the first being to Kingsmere on October 15. Some of the excursionists had the pleasure of inspecting the gardens of the Prime Minister the Rt. Honourable W. L. Mackenzie King who had kindly opened his grounds for this occasion. An excursion to Blue Sea lake in the Laurentian highlands was attended by thirty-nine members.

The next meeting of the Union will be held in Washington, D.C., in the fall of 1927.

In Ontario and Quebec, which contain about 82 per cent of the manufacturing industry of the Dominion, about 90 per cent of the total power demand, excluding steam railways, is met by water-power.



## CONFERENCE HELD ON LANDS REGULATIONS

Changes Made to Facilitate Public Business and Assist Those Developing Natural Resources

With the object of maintaining the administration of Dominion Lands at the highest state of efficiency the superintendents, inspectors and agents of Dominion lands in the West were called to Ottawa in June last by the Minister of the Interior, and conferred for ten days with the Commissioner of Dominion Lands and the heads of branches of the department, on all matters relating to lands—homesteading, mining, timber and grazing, seed grain, etc. The results of the conference were embodied in a series of recommendations which were presented to the Minister for his consideration and approval. Many of the recommendations dealt with the internal economy of the lands offices but all of them were drafted with the object of facilitating the transaction of public business and of assisting those citizens who are developing the resources in or connected with Canada's public lands. The recommendations are being dealt with by the Minister of the Interior as rapidly as possible, but as some can be brought into effect only by Order in Council and others only by an amendment to an Act of Parliament they cannot all be authorized at the same time.

All persons interested will receive information concerning the changes upon applying to any agent of Dominion Lands.

## IMPORTANCE OF GYPSUM MINING IN MARITIMES

(Continued from page 1)

principal sources, shipments of crude gypsum from these properties during the summer season reaching 300,000 and 75,000 tons respectively.

Next in importance are the deposits of Victoria county, Cape Breton island. The gypsum from these quarries is calcined by mills in the locality and manufactured into finishing, hard wall, and dental plasters, and for these products a good market has already been developed in Canada and in the Antipodes.

Most of the deposits and mills referred to have the advantage of nearby rail and sea-board facilities, and with increased activity in the building trades and a consequently increased demand for the best fire-resisting materials, the industry has continued to expand. The extent and quality of these gypsum deposits are such as to indicate that an adequate supply will be forthcoming from this region for many years and new developments may be confidently awaited.

Canada's mining industries showed continued progress in the first half of 1926 and production reports from almost every field pointed to the establishment of new records during the present year according to a statement issued from the Dominion Bureau of Statistics. Valued at \$98,395,788 the output of metals and non-metallic minerals including coal, gas and oil, in the first six months of 1926 marked an advance of \$8,048,090 or 8.9 per cent over the totals reported for the first half of 1925.

## THE NATIONAL WINTER GAME

Hockey the Most Popular of Outdoor Winter Sports in Canada

Hockey is Canada's great national winter sport. Although many other forms of outdoor recreation are enjoyed during the invigorating season of ice and snow none of them has attained the position of popularity among all classes that is held by hockey. No other game requires so much speed, accuracy, endurance, strength, hardihood and quick-thinking in the player, nor does

and these players take up their positions facing their opponents. The rules of the game are very simple and a new spectator requires only a short instruction in order to be able to follow the play. The general object is to place the puck in the opposing team's goal the greatest number of times during the period of the game, which is in league games sixty minutes.



The National Winter Game—The above picture of one of Canada's championship teams engaged in practice on an open air rink.

any other form of sport so fascinate and thrill the spectator. This great winter game holds among Canadians, both young and old, a position similar in many respects to that occupied by the summer pastime, baseball, among the citizens of this continent. To the younger enthusiasts the cleared ice-surface, whether it be on frozen stream, river, lake or in a backyard, serves the same purpose for hockey that the sandlot does for the playing of baseball. There the young hockey player receives his grounding in the game and there also is aroused the ambition to one day compete in the great amateur and professional series which are conducted each winter throughout the Dominion.

In hockey, as in most other sports, it is the rule that those who would become especially proficient must play the game from childhood. The small neighbourhood rinks and the rinks maintained by playground commissions in the various cities, are the proving grounds for the future "big league" stars. There the youthful aspirant learns the principles of the game and develops the sturdiness of frame and co-ordination of action of foot, hand, and brain which are so essential in the successful hockey player. However, in the clear invigorating air he gains more than outstanding skill in a form of recreation: the foundations for good health and sound moral character are laid, initiative is developed, as well as a spirit of fair play and good sportsmanship.

Six players equipped with skates and hockey sticks comprise a hockey team. Each team consists of a goal-keeper, two defence players, and three forwards;

The first game of ice hockey in Canada of which there is any official record was played in Kingston, Ontario, in 1888. Whether other games not recorded were played about that time is not clear but what is certain is that from that date hockey developed rapidly in all parts of the Dominion. So great is the popular interest in the game that although new and larger rinks are constantly being erected, the demand is ever for more accommodation for players and spectators. The game is taking hold in the northern United States and gaining in popularity there as the chief winter sport. Ice hockey has also obtained a definite foothold in the United Kingdom and in several of the countries on the Continent.

Literally hundreds of hockey leagues operate throughout the Dominion during the winter season, providing sport and enjoyment for the majority of the population. The senior competitions are those for the Allan Cup and the Stanley Cup. The Allan Cup series is among the senior amateur teams of Canada for a trophy donated in 1908 by Sir Montagu Allan, of Montreal. In the professional series, which is similar to the contests leading up to the world's baseball series in the United States, the ultimate object is the possession of the famous Stanley Cup, presented by Lord Stanley, while Governor General of the Dominion, in 1893, which represents the championship of the world.

Hockey is played in every province of the Dominion and is as much the game of the people in the great outlying farming districts and in the centres of the lumber and power industries, as it is in the larger cities. Of recent years the installation of artificial ice-making

## NEW REGULATIONS GOVERN OIL AND GAS

Deal With Boring and Operation of Wells on Dominion Lands in Western Canada

In respect to the natural resources of petroleum and natural gas on Dominion lands in the western provinces the aim of the Government is to conserve these resources for the benefit of the country by preventing waste during their development and utilization, while at the same time facilitating the work of those engaged in boring and operating the wells. To this end the Minister of the Interior, by virtue of powers conferred on him by Parliament, has just authorized additional regulations governing the manner in which boring operations shall be conducted and that in which wells shall be operated.

These regulations have been drafted after a careful study of similar regulations governing other fields and with full knowledge of the conditions in fields in the Prairie Provinces, the Yukon Territory, and the Railway Belt and Peace River Block in British Columbia.

Copies of the new Regulations may be obtained upon application to any agent of Dominion Lands or to Mr. C. C. Ross, Supervisory Mining Engineer, Department of the Interior, Calgary, Alberta.

## WINTER SPORTS IN CANADA

(Continued from page 1)

The best of it all is that these sports all tend to develop players rather than spectators. Everywhere young people are joining the ranks; everywhere there is room for the novice and the learned. And, even though one may not take part in high-class hockey or in ski-jumping contests, no one who has learned to skate or to ski ever becomes too old to enjoy the delightful sensation of smoothly gliding with scarcely perceptible effort over the surface of the earth amid picturesque scenes of winter beauty, the enjoyment of which is heightened by the sparkling sunlight and the tang of the pine-scented air.

It is because of these varied appeals that Canada's winter sports constantly increase in popularity and attract a steadily growing throng of devotees both from Canadian communities and from those beyond our boundaries.

plants in the rinks in the principal cities has lengthened the hockey-playing season by several weeks. Where artificial ice may be had, skating and hockey are begun as early as the middle of October and continue until late in March. However among the great majority of skating and hockey enthusiasts, and particularly among those who must depend on natural ice, the season does not get under way until the early part of December; and the mild weather usually encountered in mid-March rings down the curtain on these recreational activities at it does on many others.

In the proportion of the total power demand met by water-power Canada occupies a unique position. The Census of Central Electric Power Stations shows that 95 per cent of the total installation is in hydraulic plant and that this furnishes over 98 per cent of the total output.



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## AERIAL SURVEY OPERATIONS IN CANADA IN 1926

### A VALUABLE AID TO DEVELOPMENT

#### Activities Extended Over Various Parts of Dominion—Program Successfully Carried Out

The value of aerial photography in its application to mapping has been demonstrated many times since the commencement of this work a few years ago. By its use it is possible to map with speed and economy lands which would require a tremendous expenditure of time and effort to cover by the ordinary ground methods. Thus it is possible to employ aerial photography in the mapping of our hitherto unmapped areas when to produce maps of the same order of accuracy and detail by other methods would, from a standpoint of economy, be out of the question.

This work has been carried on since its inception, five years ago, by the Topographical Survey, Department of the Interior, working in co-operation with the Royal Canadian Air Force, Department of National Defence. In the office of the Topographical Survey, all aerial photographs used in mapping are indexed and filed and may be referred to at any time for information relating to the development of the country. Such information is of the utmost value, and generally could not otherwise be obtained without the expenditure of a tremendous amount of time and money in personal investigation over the territory in question.

Operations during the 1926 season extended over various parts of Canada. One of the areas included was that of the new Rouyn mining district in the province of Quebec, the Shirley Bay station near Ottawa being used as a base and the necessary ground field work being performed by the Geological Survey of Canada. The photographs which covered an area of over 5,750 square miles in this locality were all taken in a systematic manner and show great wealth of detail which will be of service in revising the maps of the district and in rendering assistance to the geologist, the forester, and the prospector, and for the development which will follow the opening up of this mineral area.

In northwestern Ontario, aerial photography was carried on over the region lying in general to the east of that covered by the 1925 season, and extend-

(Continued on page 4)

## POPULARITY OF SKI-ING IN CANADA

### Great Outdoor Sport Has Gained Thousands of Devotees in Every Province of the Dominion

Ski-ing has made tremendous strides in Canada during the last few years. This great outdoor sport has swept the country from coast to coast, enlisting armies of recruits, and is fast becoming one of the most popular of our winter pastimes. No outdoor activity repays its devotees with a more abundant measure of health and strength;

that ski-ing has so far gained its greatest popularity. Clad with snow during the greater part of four months, the vast expanse of hilly land, north of the Ottawa and St. Lawrence rivers, particularly in the Quebec-Montreal-Ottawa zone, provides ideal conditions for pleasure ski-ing. Although the opportunities for a display of skill or dar-



Popularity of Ski-ing in Canada—A familiar scene in the Laurentian hills near Ottawa.  
A party of skiers at one of the ski camps in the Gatineau district.

none provides greater delight or a keener sense of freedom. Under a velvety mantle of snow, the bush trail, the lakes, the swamps, obstacles during a summer jaunt, become easy to traverse. Like the snowshoe the ski provides the key to the wilderness, giving the freedom of the land.

The universality of ski-ing is its outstanding characteristic. This sport appeals to all, young and old, rich and poor alike. There are perhaps just as many skiers over forty years of age as there are under; just as many mounted on cheap birch or pine skis as on the more expensive and more durable hickory or ash. Skill in swings and turns is, doubtless, a very desirable accomplishment and requires a great deal of practice, but real enjoyment can be had while the novice is becoming proficient, and although the unskilled skier may fall oftener he also has his share of the fun.

Conditions for ski-ing in Canada are somewhat different from those which obtain in the Swiss or French Alps. In the Canadian Rockies there is an approach to the conditions in the mountainous areas of Europe, but it is in the hilly sections of Eastern Canada

are not so great as those that are afforded by the Swiss or French Alps, which are many thousands of feet higher than the highest hill of the Laurentians, yet they appeal more strongly perhaps to the average skier, as there is not the same necessity for preparatory training, and the enjoyment derived is almost as keen.

Nowhere perhaps has the progress of ski-ing been more marked than in the cities of Ottawa and Montreal, where the devotees of the sport repair by thousands to the nearby hills. Ottawa is particularly fortunate in the fact that the ski-ing grounds extend almost to the gates of the city and may be reached in fifteen minutes' car or train ride. The Capital boasts of having one of the largest, if not the largest ski club in the world—the Ottawa Ski Club—which has now a membership of over 1,600, and there are several smaller clubs in addition. The total number of skiers in the city has been estimated at between seven and eight thousand.

Numerous trails have been cut in the wooded hills of the Gatineau district, on the north side of the Ottawa river; many camps have been built,

(Continued on page 3)

## ACTIVITIES IN NEW BRUNSWICK POWER INDUSTRY

### WORK BEGUN AT GRAND FALLS

#### Development of Site on St. John River of Immense Importance—Other Projects

A decided stimulus was given to hydro-electric development in New Brunswick with the inauguration, on August 10 last, of construction work at the Grand Falls power site on the St. John river.

The St. John is the largest river in the Maritime Provinces and at Grand Falls where its drainage area is 8,700 square miles it flows over a sheer drop of 70 feet and then rushes through a rocky gorge 4,000 feet long, falling an additional 49 feet in a series of cascades and describing a bend around the town of Grand Falls.

The high head and large flow of water, the accessibility of the site by means of three railways, its favourable situation with regard to timber resources and its easy transmission distance to all parts of New Brunswick, combine to make of Grand Falls a water-power site of first class magnitude and importance. Its development has been a live question in New Brunswick for many years. Active construction is now being carried out by the St. John River Power Company, incorporated by Act of the Legislature of New Brunswick in April, 1926.

The development as planned will consist of a dam at the head of the falls, a tunnel through the rock underneath the town of Grand Falls and a generating station at the lower basin, below the gorge. The installation will consist initially of three 20,000 horse-power units (under a head of 130 feet), which can be added to as the regulated flow of the river is improved by storage development in the upper watershed.

The greater part of the power from Grand falls is to be used in newsprint mills to be erected by the New Brunswick International Paper Company, while 20,000 horse-power is to be reserved for sale to the Fraser Companies, Limited, and 6,000 horse-power will be held for the use of the New Brunswick Electric Power Commission.

While the development of Grand falls is of outstanding interest there have been other activities on a smaller scale in the hydro-electric field and two important projects are in active prospect. In connection with the Musquash plant of the New Brunswick

(Continued on page 2)



## DISCOVERIES RECALL FRANKLIN EXPEDITION

### Objects Recovered in Canadian Arctic Regions Believed to be Relics of Ill-fated Voyage

"Start on to-morrow, 26th, for Back's Fish river." This, the concluding sentence in a record dated 25th April, 1848, and signed by Captain F. R. M. Crozier of H.M.S. *Terror* and Captain James Fitzjames of H.M.S. *Erebus*, is the last word received by the outside world from the gallant but ill-fated Franklin expedition. Though that message was written seventy-eight years ago, and was recovered in 1859, it has a direct bearing on events in the Canadian Arctic in 1926, in that during this year further relics believed to be of the Franklin expedition were recovered in the district and along the very line of travel that the above record indicated.

To explain the finds and their significance it will be necessary to give the salient facts of the Franklin expedition. Sir John Franklin, an experienced Arctic navigator, headed an expedition which sailed from England in 1845 in two ships the *Erebus* and *Terror*, with the object of discovering a "northwest passage" which would provide a short route to Asia. Several years passing without news of the expedition, relief parties were sent out by sea and land and it was by these expeditions and by further attempts to learn the fate of Franklin and his men that the few details now known were secured. In 1850-51 Captain William Penny located the site of Franklin's first winter quarters on Beechey island; in 1854 Dr. John Rae learned from natives that a party of white men had been seen travelling over the ice near King William island; and in 1859 Captain M'Clintock found many relics, including Captain Crozier's record, already referred to, reporting the death of Franklin, the abandonment of the two ships in the ice to the west and north of King William island, and indicating the attempt of the 105 survivors to make their way south.

Of recent years little additional information about Franklin had been secured but during the summer of 1926 Peter Norberg, a trader, picked up a skull, pieces of shoe leather, pieces of navy cloth and a fragment of an oak sled runner, at Starvation cove on Adelaide peninsula opposite King William island. The significance of this discovery is that the relics were found on the route that the survivors would have to take in order to reach Back's Fish river. This river is now called Back river after its discoverer Captain George Back, R.N. Mr. Norberg who is retiring from trading turned these relics over to Mr. John F. Moran, Inspector of the North West Territories and Yukon Branch of the Department of the Interior, when he was at Aklavik last summer and by him they were brought to Ottawa and they are now deposited in the Branch museum. The navy cloth is similar to that used by the Royal Navy in Franklin's time, and the skull, it is stated by ethnologists, is that of a young white man in his early twenties.

Other indications point to this part of the north as being the place where the survivors made their last attempt to reach safety. Mr. W. H. B. Hoare, who explored the country south and west of Coronation gulf during 1924-26



New Brunswick Power Industries—View of Grand falls on the St. John river where construction work on the largest hydro development in the province is now in progress.

for the same branch of the Department of the Interior found a wooden bowl similar to that used in the naval service many years ago. Although it was found in a place where, apparently, no white man had ever been before, there is every reason to believe that it was from one of the Franklin ships and carried there by Eskimos.

Major L. T. Burwash, also an explorer in the North West Territories and Yukon Branch of the Department of the Interior, spent the winter of 1925-26 on King William island and investigated, so far as possible, the story current among the natives there that a large ship lies submerged under twelve feet of water among some reefs to the east of Matty island. This information was corroborated from five different sources all of which agreed in detail, but as the sea was frozen he was not able to do more than gain a knowledge of the location. That location, however, is consistent with the known facts as to the place where the ships were abandoned, and the set of the currents. According to reports of natives the ship was driven over a reef and broken in two, and it can be seen quite clearly when the ice goes out in the short Arctic summer. Major Burwash was not able to form an opinion as to which of the two ships it might be. He secured a number of relics in the form of scraps of brass and iron; a piece of mahogany, apparently part of a quarter-deck railing; a wooden bowl, similar to the one found by Mr. Hoare; etc. He concluded from the amount of iron being used by the natives for spear and arrow points, that a large quantity of European goods, particularly casks and cases, hooped and bound with iron, must have been scattered along this coast.

Of course, what all explorers search for are log books or memoranda of any kind, but the finds of this season did not include such treasures.

The survey of the boundary between the provinces of Alberta and British Columbia established the existence of a watershed from which water flows to three different oceans. The Columbia ice-field which covers an area of about 110 square miles, culminating in the Snow Dome, gives rise to glaciers which feed mountain streams tributary to the Columbia, Athabaska, and Saskatchewan rivers, emptying eventually into the Pacific, Arctic, and Atlantic oceans respectively.

## ACTIVITIES IN NEW BRUNSWICK POWER INDUSTRY

(Continued from page 1)

Electric Power Commission, a concrete storage dam is under construction at Loch Alva, to replace the temporary timber dam initially constructed, and will be completed before the end of the year. Two extensions to the transmission system are also under way and are intended to serve the small communities of Lepreau, Blacks Harbour, and Shediac.

This hydro-electric plant at Musquash, of 11,000 horse-power installed capacity, has become an important factor in the community life of the southern portion of the province. It is supplying energy to the industrial centres of St. John and Moncton, and to an increasing number of small towns and villages between Blacks Harbour and Shediac. For the year ending October 31, 1926, it delivered to the Musquash transmission lines over twenty-two million kilowatt hours of electric energy.

In view of the increasing demands on the Musquash system the New Brunswick Electric Power Commission is on the lookout to secure a further supply of power. At the present time it is actively engaged upon an investigation of the Meductic Falls site on the St. John river about forty miles above Fredericton, which may involve the building of a 50,000 horse-power generating station with transmission lines to the territory served by the Musquash system and to other portions of the province.

On the Nipisiguit river investigations have been completed looking to an increased supply of power to the pulp and paper operations of the Bathurst Company, Limited, and a tentative program of development has been planned by the company which will if carried out probably furnish 40,000 horse-power.

The development of these and others of New Brunswick's water-power resources will further a diversification and extension of industry in the province.

## CONSUMPTION OF ELECTRICITY

Canada now leads the world in the public per capita distribution of electricity from central electric power stations. The figures of kilowatt-hours generated per capita per annum by the five leading countries are: Canada 1,260, Switzerland 886, United States 581, Sweden 467, Norway 370.

## FURTHER SHIPMENT OF BUFFALO TO NORTH

### Over 2,000 Surplus Animals Moved This Year From Wainwright to Northern Reserve

During the past summer the Department of the Interior continued the experiment of moving buffalo from the national herd at Wainwright, Alberta, to the great 17,000 square miles of natural feeding grounds known as Wood Buffalo park near Fort Smith, Northwest Territories. Canada's success in saving the buffalo from extinction is shown by the fact that the national park near Wainwright, which is approximately 15 miles long and 13 miles wide, is not large enough to provide grazing in an average season for a further increase in the herd.

Excepting in a few particulars, the movement was carried out along the same lines as in 1925. The animals were forwarded by rail to Waterways and thence by scow to the unloading point on the Slave river about seventeen miles south of Fitzgerald.

Eight trips were required to transport the 1,435 yearlings, 493 two-year olds, and 83 three-year olds selected, and the last consignment left Wainwright on August 16 reaching its destination a week later. The entire operations were carried out with only a comparatively few losses. Reports made by the wardens, who for some years have been guarding the wood buffalo and who are now responsible for the new arrivals, indicate that the buffalo shipped last summer have wintered well and are in the best of condition. Quite a number of calves were noticed this year with the buffalo which were sent from Wainwright in 1925, and all the other signs point to the successful issue of this northward transfer of the plains buffalo.

## CANADIAN TREE SEEDS

One of the many interesting activities of the Forest Service, Department of the Interior, Canada, is the collection and extraction of tree seeds. Four special seed-extraction plants now operate in the western provinces for the purpose of securing seeds from the cones of coniferous trees. During the winter of 1925-26 these four plants extracted twenty-five hundredweight of seeds. Large quantities of seed are supplied to the Forestry Commission of the British Isles for use in carrying out the program of reforesting unoccupied lands in Great Britain. Seed has also been shipped to the Forest Service of New Zealand for a similar reforestation program in that Dominion. In the latter connection it is interesting to note that the New Zealand Forest Service is headed by a Canadian who received his forestry training in Canada.

Production of explosives, ammunition, fireworks and matches in Canada in 1925 amounted in value to \$12,313,155, according to the Dominion Bureau of Statistics. Explosives produced during the year were valued at \$7,999,856, ammunition at \$2,129,975; fireworks totalled \$128,684 in value and the output of matches, \$2,054,640.



# NATURAL RESOURCES CANADA

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OTTAWA, DECEMBER, 1926

## TOURIST TRAVEL TO OUR NATIONAL PARKS

Increase in Number of Visitors During  
1926—Rocky Mountains Resorts  
Popular

The 1926 summer season witnessed the establishment of new records in the number of persons visiting Canadian National Parks. As the value and importance of these great scenic and recreational reserves become better known to the people of Canada, the United States and other parts of the world, each succeeding season brings a greater influx of visitors.

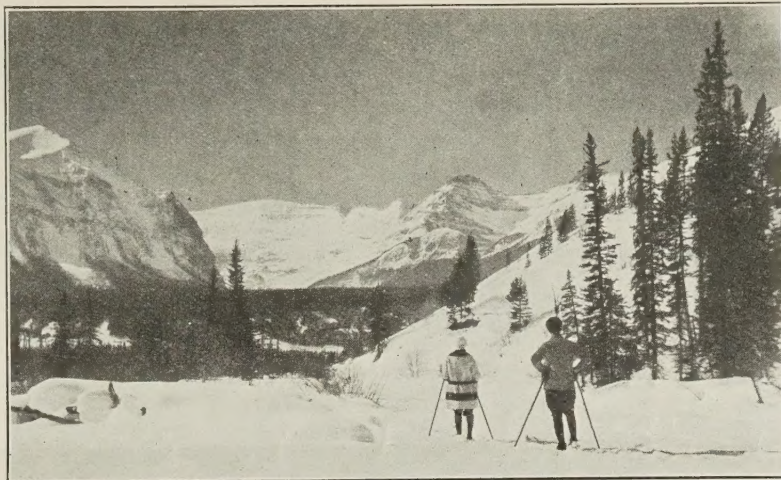
While this increase has been general it has been most noticeable in the matter of motor tourists. Advances made in the automobile industry and in the construction of good roads have brought corresponding advances in the growth of motor travel, until this traffic has become of great importance in the development of the country.

Highways play an important part in drawing a large number of the tourists who visit Banff and Kootenay National parks by motor. Through the Kananaskis gateway, which is the eastern entrance to Banff park, and the Radium Hot Springs gateway, which is the western entrance to Kootenay park, there passes each year the greater part of the motor traffic to the Canadian parks in the Rockies.

The volume of travel which poured into these two parks by motor is shown by the registrations. At the Kananaskis gateway at the end of October 18,069 motor cars had been registered as incoming; at Radium Hot Springs gateway, 6,593 entries were recorded, making a total of 24,662 cars entering the two parks. This number shows an increase of 5,780 over the 18,882 entries recorded in 1925.

Waterton Lakes National park, in southern Alberta on the International Boundary, drew an amount of tourist travel in excess of that recorded in 1925. The possibilities of this scenic wonderland are accentuated by the plans for extensive development announced in 1926.

The opening, in June, 1926, of the motor road extension from Lake Louise to Field brought Yoho National park for the first time into prominence in the motor tourist world. The further extension of this road which will en-



Winter adds its touch to a scene of great beauty in the Canadian Rockies—On the ski trail in Banff National park.

### POPULARITY OF SKI-ING IN CANADA

(Continued from page 1)

where skiers can find warmth and shelter. Each week-end, by every available means of transportation—busses, cars and trains—and from early dawn until high noon, thousands of skiers go to pick up the ends of these trails, and spend a day in the open, making provision of health and strength. Thousands make hikes of from six to twenty miles during a day, in this fashion, over hill and dale.

Everyone carries his or her supplies for the day in a small knapsack, and the skiers do their own cooking in one or other of the camps, scattered at many points of the snowy wilderness. From these camps, some of which have an altitude of 1,400 feet, and are ten miles distant from Ottawa, series of wonderful trails lead, by swift descents, to the gates of the city. The return trip from the more distant camps can be made comfortably in two or three hours.

able motorists to proceed through to Golden, is expected to be opened to travel early in 1927. Traversing Yoho park and thence leading on to Golden, along the Columbia valley to the junction with the Banff-Windermere Highway, this newest motor way opens up a field which is wonderfully rich in scenic resources and has hitherto been unknown except to travellers by pack train.

Jasper National park, in the northern part of Alberta, had a most successful season, nearly 7,000 hotel registrations having been recorded prior to the end of October. This great playground is rapidly finding wider favour with the tourist public as the steady growth in the number of visitors attests.

The National Buffalo park at Wainwright, Alberta, drew more visitors than in former years. A very keen interest is being taken in all countries, particularly Canada and the United States, in the efforts of the Canadian Government to preserve the buffalo and also in the experiments that are being conducted at Buffalo park in cross-breeding.

Reports received from the smaller parks follow those of the larger reservations. A larger number of persons than in 1925 visited Fort Anne National park, Annapolis Royal, Nova Scotia. The recreational reserves comprising the St. Lawrence Islands parks were also very popular during the summer.

There are also splendid opportunities for ski-ing in the hilly country back of Montreal, including Shawbridge, St. Agathe, etc., where good hotel accommodation can be had and where hundreds of skiers are taken by special train at reduced rates every week-end and holiday.

Competitions in ski-jumping and ski-running, attracting thousands of spectators, are arranged by the various clubs under the Canadian Ski Association. Young Canadian skiers have not been long in asserting their supremacy in this sport as in many others. In 1924, the ski-running championship for the Dominion was won by a young Ottawan, Edmond Condon, in open competition with Norwegian born; and in jumping, the distances covered on Rockcliffe jumping hill in Ottawa and the Cote des Neiges hill in Montreal are also very creditable.

In Western Canada the slopes of the Rocky mountains provide opportunities for exhibitions of skill and daring unapproached in the East. In the foothills to the east of the Rockies in Banff National park and at Calgary, Alberta, and in Mount Revelstoke National park on the western slope of the great range, increasing numbers of skiers gather each season for this thrilling and invigorating sport. Competitions are held at these points each winter and the feature is the great tournament on the famous Revelstoke hill. Several world's records have been created by skiers on this great natural hill and jump. Due to the length and gradient of the runway before the take-off and the steepness of the landing point beyond, competitors must possess rare skill and courage to negotiate successfully this course; experts consider it the equal of the famous Blumenthal hill in Norway. In February, 1925, Nels Nelsen, of Revelstoke, outdistanced all previous jumping records with a remarkable leap of 240 feet. This effort surpassed his previous amateur mark of 212 feet and also exceeded the professional record of 229 feet set by Henry Hall, of Detroit, Michigan, on the Revelstoke hill.

It is no exaggeration to say that in Canada ski-ing has changed the whole outlook on winter. The advent of the cold season is now eagerly anticipated. With the opportunities that it gives for the enjoyment of winter sports, and especially of ski-ing, winter has become our best national asset, and tourists in ever-increasing numbers come from beyond our borders to spend a few days or weeks on skis in the ozone-laden air of the Laurentians or the Rockies.

## CANADA'S EQUIPMENT FOR CARING FOR SICK\*

Census of Hospitals Made By Department  
of Health Reveals Interesting Facts

People are, for the most part, seized of the fact that Canada is a land of far-flung borders and immense distances but it is another matter to keep up with the steadily increasing stream of information showing how far the nation has progressed in carrying out the duty of caring for the welfare of its citizens. Canada has one of the most healthful of climates but when the results of accident or disease have to be combated, theory and practice both suggest that a properly equipped and staffed hospital is a great aid. To ascertain what our equipment was in this regard the Department of Health took a census of hospitals for 1925, and has issued a bulletin giving the results. There are 676 hospitals in Canada, not including those for mental patients or sanitariums for tuberculosis patients. Of these 388 are public hospitals, 259 private, and 29 Red Cross. As might be expected the public hospitals are by far the largest units. They average a little over 66 beds per hospital; private hospitals average 8½ beds each, and Red Cross hospitals, 5 beds each. Grouping all hospitals together the following table shows the number of hospitals and number of beds in each province:—

Province	Hospitals	Beds
Nova Scotia . . . . .	29	1,313
New Brunswick . . . . .	20	933
Prince Edward Island . . . . .	3	185
Quebec . . . . .	48	4,012
Ontario . . . . .	178	9,043
Manitoba . . . . .	46	2,572
Saskatchewan . . . . .	115	2,247
Alberta . . . . .	132	2,571
British Columbia . . . . .	101	3,587
Yukon . . . . .	3	72
Northwest Territories . . . . .	3	29
Totals . . . . .	676	28,076

The report contains a map of Canada showing where each hospital is located and it is interesting to note how far these agencies of healing penetrate into our great hinterland. Of equal interest as showing how rapidly the work is growing is a note on the back page to the effect that thirteen hospitals have been opened in 1926 which are not included in the body of the report. These comprise the Presbyterian Church hospitals at South Porcupine, Ontario, and McMurray, Alberta; the United Church hospital at Ericksdale, Manitoba; the Roman Catholic hospital at Vilna, Alberta; a private hospital at Campbell River, British Columbia; and the Church of England hospital at Aklavik, Northwest Territories. The following seven Red Cross outpost hospitals at the points indicated complete this list, Hudson, Kirkland Lake, and Red Lake, Ontario; Bracken and Wood Mountain, Saskatchewan; and Beaver Lodge and Killam, Alberta.

\* Prepared under the direction of Dr. J. A. Amyot, Deputy Minister, Department of Health, Ottawa.

The boundary between Alberta and Saskatchewan is the Fourth meridian of the Dominion Lands system of survey. This has been surveyed and marked on the ground from the International Boundary to lake Athabasca a distance of approximately 700 miles, by the Topographical Survey, Department of the Interior. So far as is known this is the longest surveyed straight line in the world.



## HOW LAKE WINNIPEG RECEIVED ITS NAME

Canadian-Born Were First to Describe and to Visit This Manitoba Lake

When did white men first hear of the existence of lake Winnipeg; who was the first white man to describe it; and who the first to gaze upon its expanse of waters?

According to the Geographic Board of Canada, Europeans learned of the existence of the lake about one hundred years before the date on which it is known a white man visited it. The lake became known to the Jesuit missionaries from the reports of roving Indians belonging to tribes living upon its shores. In the report sent home to France of the happenings of the year 1640, there is a reference to the "Ouini-pigou" or "dirty people," so called because the word "Ouini-pigou," the name of the unknown sea from the shores of which they came, meant "dirty water." The term "dirty water" is generally taken to refer to the turbid appearance of the lake after a storm.

The first person to give a correct description of the lake is the Canadian-born Nicolas Jeremie, who spent twenty years at York Factory on Hudson bay and published, at Amsterdam in 1720, an account of his experiences. Jeremie never ventured inland from Hudson bay, but has left excellent descriptions of the Nelson, Hayes, and Churchill rivers and their tributaries. Lake Winnipeg he refers to as "Michinipi" or "big water" because it is the largest and deepest of the lakes of that chain. Jeremie also refers to lake Winnipegosis, calling it "Ouenipigouchib."

The first white man actually known to have visited lake Winnipeg was also Canadian-born. This was Jean Baptiste de la Verendrye, who in 1734 founded Fort Maurepas on the right bank of Winnipeg river near its mouth in lake Winnipeg.

## FIFTIETH ANNIVERSARY FIRST WHEAT SHIPMENT

Significant Celebration Held in Winnipeg  
—Remarkable Growth of Wheat Movement

Very significant was the celebration organized this autumn by the Winnipeg Board of Trade to mark the fiftieth anniversary of the first shipment of wheat from the Canadian West. Wheat had been successfully grown in the Red River valley from 1812 onward but before 1876 only for home consumption. In the latter year there was a serious failure of the spring wheat crop in Ontario, which it was felt was due to the fact that the old Red Fife variety in that province had lost its vigour. The fame of the wheat grown in the Red River valley had begun to spread, and in the autumn a seed merchant of Toronto decided to try to secure 5,000 bushels of wheat for seeding. As railways had not then reached the Canadian West the most expeditious method of travel was to the end of rail at Fisher's Landing on the Red river in Minnesota, and thence by river steamer to Winnipeg. The seedsman arrived in Winnipeg only a day or two



Aerial Survey Operations—Vertical photograph, taken at a height of 9,000 feet, of the town of Rouyn, the centre of the new mining district in western Quebec. The town is at the western end of Tremov lake. The light patches to the right indicate mine workings and the light line crossing the upper right hand corner shows where the railway right of way has been cut through the bush. This photograph is one of the series which covers this mining area.

### AERIAL SURVEY OPERATIONS IN CANADA IN 1926

(Continued from page 1)

ed from the Red Lake area into the Woman Lake and Lake Nipigon districts. Consequent upon the 1925 field work, the first aerial maps of the Red Lake district became available early in the spring of 1926, at a time when their need was greatly felt. They proved of great assistance to prospectors, geologists, mining recorders, and others engaged in the development of this mineralized area, the demand for them exhausting the initial issue in a few weeks. This aerial photographic mapping work was carried on in co-operation with the geological and survey divisions of the Ontario Government, a large extent of hitherto unmapped territory being successfully photographed. These photographs reveal thousands of lakes and in addition furnish accurate records of the character of the country, and give information which will make possible the preparation of base maps for the guidance of the prospectors as well as for those engaged in patrols for forest fire detection and suppression.

In September the planes were moved into Manitoba to undertake photography in the forested areas in the vicinity of The Pas and Norway House where they operated until freeze-up, about the middle of October. During this period over 18,000 square miles were successfully photographed. The fall season of the year was chosen for this work on account of the advantage to be obtained in photographing forested areas, when the change of colour in the leaves is of the greatest assistance in detecting and delineating the various timber types.

before the sailing of the last steamer of the season. In the brief time available he was able to secure only 857 bushels. This was sacked and shipped by steamer to Fisher's Landing, thence by rail to Toronto. At the recent celebration in Winnipeg it was pointed out that the grain movement inaugurated by this tiny consignment of 857 bushels in 1876 had grown to total shipments of nearly 350,000,000 bushels in the crop year 1925-26.

From the High River base, Alberta, photographic work was carried on in the Calgary district. From this base also a plane was dispatched to the Battleford and Prince Albert districts. In these three localities some 2,090 square miles were photographed.

In addition to those enumerated above, many small scattered photographic operations were undertaken, all designed to assist in the development of the natural resources of the country. These operations were correlated with the major operations in such a way as to minimize the expenditure of time and money, and were usually required in connection with water-power projects, forestry, geological investigations, and other purposes. Until the late autumn, work was carried on in the vicinity of the Batiscan river in Quebec and on Vancouver island in British Columbia.

The year was a very successful one and the resulting maps will greatly assist in the development of the resources in the areas covered.

### OUTPUT OF SILICA IN CANADA INCREASED

During 1925 the production of quartz (silica) in Canada was considerably higher than the total recorded in the preceding year. According to statistics issued by the Dominion Bureau of Statistics shipments of quartz during 1925 reached a grand total of 197,224 tons valued at \$363,612 as compared with 150,896 tons at \$323,156 shipped in 1924.

The production by provinces in 1925 follows:—

Province	Tons	Value
Nova Scotia . . . . .	1,352	\$ 6,760
Quebec . . . . .	6,459	30,064
Ontario . . . . .	188,560	324,526
British Columbia . . . . .	853	2,262
Totals . . . . .	197,224	\$363,612

According to a recent report of the Topographical Survey, Department of the Interior, the absolute measurement of a surveyor's steel band tape can be determined by the Physical Testing Laboratory within an error of one in a million.

## ALBERTA TAR SANDS UNDERLIE WIDE AREA\*

Northern Alberta Deposits Cover 2,000 Square Miles—Interesting Report on Investigations

Sands which have become saturated with a heavy asphaltic oil or a semi-liquid bitumen are known to underlie an area in excess of 2,000 square miles in northern Alberta, in the vicinity of McMurray on the Athabaska river. These deposits are usually referred to as the bituminous sands of northern Alberta.

This interesting area has been surveyed in great detail by Mr. S. C. Ellis, of the Mines Branch. During the past ten years, numerous samples of the saturated sands have been subjected to analysis, and much experimental work has been undertaken to discover commercial uses for the materials present in these beds. Upwards of 250 exposures, all within 60 miles of McMurray, have been examined and measured.

While the deposits themselves are very extensive, and represent the largest known occurrences of solid asphaltic material, the actual area that is readily accessible for commercial operation is probably not more than three square miles. The rest of the deposits lie beneath a heavy overburden and will be relatively expensive to operate commercially. The bitumen content of the more valuable portions of the beds varies from 12 to 15 per cent, with higher percentages in limited areas. The crude material has been used for surfacing sidewalks and highways. Separated bitumen can be used for industrial purposes.

A recent report on these deposits, entitled "Bituminous Sands of Northern Alberta," describes the results of the investigations to the end of 1924. It contains brief and concise descriptive statements concerning the general character of the deposits, and gives the results of numerous laboratory determinations and analyses; the subject of development is considered and references are given to possible sources of fuel and power, transportation, markets, climatic conditions, and other factors which must be considered in connection with commercial operations. The report also carefully reviews the various processes that have been designed either to utilize the bituminous sands in their natural condition or to recover the oils and asphalt from them.

This report is a comprehensive volume of 244 pages, fully illustrated with photographs and diagrams. It is accompanied by eight detailed maps and four cross-sections, the latter showing the relative position of the bituminous sands with respect to the overlying strata and the present topography. Copies may be obtained from the Department of Mines, Ottawa, Canada.

\* Prepared at the direction of Dr. Chanté Camshell, Deputy Minister, Department of Mines, by A. W. G. Wilson, Ph. D., Mines Branch.

The total horse-power installed in water-power plants in Canada has grown from 170,000 in 1900 to 4,290,000 at the end of 1925 and the horse-power per 1,000 of population from 45 to over 450, this increase per capita mainly representing increased manufacturing capacity.







